SIATE OF CALIFORNIA
ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

In the Matter of:	
Exide Corporation 2700 Indiana Avenue Vernon, CA 90058 US EPA ID No : CAD 097 854 541	Docket No : P3-01/02-010
Exide Corporation 2700 Indiana Avenue Vernon, CA 90058 Respondent	CORRECTIVE ACTION CONSENT ORDER Health and Safety Code Section 25187

1.0 INTRODUCTION

1.1 Parties. The Department of Toxic Substances Control (DISC or Department) and Exide Corporation (formerly GNB Battery Technologies, Inc., hereinafter referred to as "Respondent"), the owner and operator of a hazardous waste treatment and storage facility, enter into this Corrective Action Consent Order (Consent Order) and agree as follows:

1.2 Permitting Status. Respondent is the owner and operator of a hazardous waste treatment and storage facility located at 2700 Indiana Avenue, Vernon CA 90058 (Facility). The Facility engages in the management of hazardous waste pursuant to an interim status document (ISD) issued by the Department of Health Services (DHS) which was DISC's predecessor agency, on August 19, 1983.

1.3 Jurisdiction. Jurisdiction exists pursuant to Health and Safety Code (HSC) sections 25187, 25187.1, and 25200.10. HSC 25187 authorizes DISC to issue an order to require corrective action when DISC determines that there is or has been a release of hazardous waste or hazardous waste constituents into the environment from a hazardous waste facility.

If DTSC determines that the presence of any hazardous waste at a facility or site at which hazardous waste is, or has been, stored, treated, or disposed of, or the release of any hazardous waste from the facility or site may present a substantial hazard to human health or the environment, HSC section 25187.1 authorizes DTSC to issue an order requiring the owner or operator of a facility or site to conduct monitoring, testing, analysis, and reporting with respect to the facility or site which DTSC deems reasonable to ascertain the nature and extent of the hazard

HSC section 25200.10(a) mandates that DTSC require corrective action for all releases of hazardous waste or constituents from a solid waste management unit or a hazardous waste management unit at a facility engaged in hazardous waste management.

1.4 Definition of Terms The terms used in this Consent Order are as defined in section 25100 et seq. of the HSC and section 66260.10 of Title 22 of the California Code of Regulations (CCR), except as otherwise provided.

1.5 Attachments All attachments to this Consent Order are incorporated herein by this reference

1.6 Purpose The parties enter into this Consent Order to avoid the expense of litigation and to carry out promptly the corrective action described below. The Respondent agrees to implement all approved work plans and to undertake all actions required by the terms and conditions of this Consent Order, including any portions of this Consent Order incorporated by reference. Respondent waives any right to request a hearing on this Consent Order pursuant to H&SC section 25187.

1.7 Non-Admission of Liability. By entering into this Consent Order, Respondent does not admit to any findings of fact or

conclusions of law as may be set forth herein

2.0 FINDINGS OF FACT

2.1 In October 1990, DTSC completed a RCRA Facility Assessment (RFA) which identified solid waste management units (SWMUs) and areas of concern (AOCs). Additional SWMUs and AOCs were revealed in DTSC's review of the May 1997 Part B application. Tables 1 and 2 identify SWMUs and AOCs, where DTSC has determined that there has or may have been a release of a hazardous waste or constituent based upon the 1990 RFA, the list in the May 1997 Part B application, and its review of the May 1997 Part B application. Figures 1 through 5 illustrate the locations of the SWMUs and AOCs. DTSC has determined that further investigation is needed to ascertain the nature and extent of contamination in the SWMUs and AOCs listed in Section 2.1, from which there has or may have been a release or threatened release of hazardous waste or constituents into the environment. The presence of hazardous waste at the Facility and the release of hazardous waste from the Facility may present a substantial hazard to human health and the environment.

TABLE 1

SOLID WASTE MANAGEMENT UNITS

EXIDE CORPORATION

VERNON, CALIFORNIA

Unit	Unit Name	Map Designation
1	Earthen Disposal Pit	A-1
2	Acid Collection and Neutralization Tank	A-2
3	Battery Storage Area	A-3
4	Effluent Treatment Area	A-4

34	Muds Holding Tanks	A-34
35	Baghouse Dust Slurry Sumps	A-35
36	Reverberatory and Soft Lead Baghouses	A-36
37	Blast Furnace Feedstock Room	A-37
38	Special Alloy Kettles and Lead Casting Machinery	A-38

TABLE 2

AREAS OF CONCERN

EXIDE CORPORAIION

VERNON, CALIFORNIA

Unit	Unit Name	Map Designation
39	Underground Fuel Tanks	A-39
40	Solid Soda Ash Product Storage	A-40
41	Aluminum Smelting Building/Sweat Building/Lead Shot	M-1
42	Northwest Storage Piles	M-2
43	Battery Breaking	M-3
44	Tin Dross Smelting Building	M-4
45	Copper Sulfate Building	M-5
46	Diesel Underground Fuel Tanks/Oil Pump House	M-6,7
47	Covered Bin Storage next to Copper Sulfate Building	M-8
48	Old Fill Area	M-9
49	Blue Lead Warehouse	M-10
50	Machine Shop and Maintenance Storage	M-11
51	Gasoline Underground Fuel Tanks	M-12
52	Storage Shed	M-13
53	Battery Loading Dock	M-14

Missing 55 56

54	Acid Pit	M-15
57	Garage	M-16
58	New Acid Neutralization System	M-17
59	Rubber Chip Storage	M-18
60	Battery Breaking	M-19
61	Rail Spur (between SE and NE yards)	M-20
62	Battery Breaking	M-21
63	Battery Storage	M-22
64	Rail-spur Off-loading	M-23
65	Classifier	M-24
66	Drainage System	M-25
67	Classifier	M-26
68	Storage Piles	M-27
69	Bins Along Drainage Channel	M-28
70	Pond in Center of SE Yard	M-29
71	Baghouse slurry sumps (2)	N/A
72	Mud holding tank piping system where below grade	N/A
73	Acid sump and piping beneath initial battery feed hopper	N/A
74	Acid collection system at hammer mill crusher/pan feeder and piping	N/A
75	Industrial Waste Clarifier within waste water treatment system	N/A
76	Waste Water Treatment System	N/A

2 2 Based on information available to DISC, DISC has determined that a release of hazardous waste has occurred at or from the following SWMUs Respondent agrees to the characterization of these SWMUs and statement of facts contained in Section 2 2 of this Consent

Order solely for the purposes of the issuance of this Consent Order.

a. Unit 3: Battery Storage Area

Spills from spent and leaking lead-acid storage batteries occurred during the operation of this unit.

b. Unit 6: Earthen Acid Dump Pit

Releases of hazardous waste took place during the operation of the unit. Sampling of the ground water in 1987 showed that this pit was one of the prime contributors to acid, lead, and other metal contamination of the ground water.

c. Unit 9: Hard Rubber Chip Wastepile

Ihe Department of Health Services (DHS) sampled leachate from the hard rubber chip waste pile in 1987 and 1989 and on both sample dates reported hazardous levels of lead leaching onto the asphalt

d Unit 10: Old Battery Separation Building

Ihe groundwater samples taken in 1987 showed that this unit has contributed to acid and lead contamination of the ground water

e Unit 11: Old Mixed Metals Extrusion Building

Irichloroethene (TCE) was used as a cooling medium during the operation of this unit and sample results taken from groundwater monitoring well MW-11 indicate the release of TCE.

f Unit 12: Zinc Alloy Operations Area

Groundwater monitoring results from monitoring well MW-5 indicate the release of zinc.

g. Unit 14: Smelting Pots

Spills occurred during the operation of this unit. In the 1950's, a spill of molten lead occurred which required cleanup of contaminated soil to a depth of 35 feet below ground surface (bgs)

h. Unit 15: Lead Oxide Building Warehouse

Powdered lead was used in the production of lead oxide. At least one release of lead oxide onto the streets adjoining the Facility was documented during the operation of this unit.

i. Unit 24: Rainwater Retention Pond

The Los Angles Regional Water Quality Control Board (LARWQCB) documented a potential release in August 1985. In August 1985 the Respondent drained water from the pond into the flood control channel and as a result water seeped under the pond's liner and damaged the liner. Samples taken by DHS on September 1, 1989, showed the pond water to have hazardous levels of soluble lead.

j. Unit 28: Polypropylene Loading Dock

DHS analyzed samples of polypropylene and leachate from the polypropylene and found hazardous levels of lead in both.

k. Unit 29: Crushed Drum Storage Piles

Samples taken by DHS in 1989 showed hazardous levels of lead and antimony to exist in the crushed drum storage piles then located in the West Yard.

2.3 Hazardous wastes or constituents have migrated or may migrate from the Facility into the environment through soil, surface water, ground water, and air pathways.

a. **Soil Matrix, Pore-gas, and Pore-liquid:**

(1) Off-site Soil Matrix Sampling - DTSC conducted soil sampling in 1994 which confirmed the off-site presence of lead contamination in surface soils

(2) On-site Soil Matrix Sampling - A number of on-site soil sampling efforts have been conducted. For example, on September 21, 1989, and on March 5, 1997, samples were obtained by DTSC from sediment accumulated in the bottom of an impoundment used for secondary containment (SWMU 24),

referred to by Respondent as the storm water retention pond, which revealed lead contamination. Due to the discovery of cracks in the liner system for the stormwater retention pond noted by DTSC in its inspections of April 30 and June 24, 1997, the pond liners were replaced in August 1997. Sampling confirmed the presence of lead contamination in the soils underlying the pond

(3) Pore-Gas - Lateral and vertical migration of gas phase contamination may have occurred from the Earthen Disposal Pit (SWMU 1) Earthen Acid Dump Pit (SWMU 6), Slag Storage Pile (SWMU 7), and Old Mixed Metals Extrusion Building (SWMU 11) The underground tank AOCs may also be sources of pore-gas migration. Elevated levels of methane, hydrogen sulfide or other gases may exist

(4) Pore-Liquid - Lateral and vertical subsurface migration of pore-liquid may have occurred from the Earthen Disposal Pit (SWMU 1), Earthen Acid Dump Pit (SWMU 6), Slag Storage Pile (SWMU 7), Old Mixed Metals Extrusion Building (SWMU 11), and Stormwater Retention Pond (SWMU 24).

b **Air:**

(1) On-site Air Contamination - Hazardous waste or constituents may be released from activities such as soil excavation for repairs or maintenance purposes undertaken at or near any of the SWMUs or AOCs On-site effects of such releases must be evaluated.

(2) Off-site Ambient Air Contamination - Respondent has emitted lead during the operation of the Facility Although the South Coast Air Quality Monitoring District (SCAQMD) has established emission limitations, Respondent may still emit

up to those numerical limits. Off-site effects of past releases of airborne lead must be evaluated together with current permitted emissions.

c. **Surface Water:**

(1) On-site Surface Water Contamination - The potential for past and present release(s) to on-site surface water exists because a flood control channel bifurcates the Facility. Samples obtained by DTSC from the channel and in nearby storm drains revealed concentrations of lead that exceeded hazardous waste level.

(2) Off-site Surface Water Contamination - The potential for past and present release(s) to off-site surface water exists because (a) water from the surface impoundment has historically been discharged pursuant to a discharge permit to the industrial sewer which ultimately discharges to the ocean after treatment; and (b) before the Facility was bermed, storm water, which may have contained lead particulates, was discharged to the adjoining streets and through run-off grates to storm drains and surface water channels.

d. **Ground Water:**

At present, a total of seventeen groundwater monitoring wells have been installed on- and off-site at the Facility. Analyses of groundwater samples from these wells indicate that hazardous constituents have migrated from areas of the Facility and have contaminated ground water underlying the Facility. The 1994 RFI work plan stated that six (6) of the SWMUs [Earthen Disposal Pit (SWMU 1), Old Mixed Metals Extrusion Building (SWMU 11), Old Battery Storage Area (SWMU

30), Earthen Acid Disposal Pit (SWMU 6), Crushed Battery Case Storage Area (SWMU 19), and Old Battery Separation Building (SWMU 19)] may be subject to Article 6, Chapter 14, Division 4.5 of 22CCR. Samples taken from on-site wells exceeded Federal Maximum Contaminant Levels (MCLs) for up to six (6) organic hazardous constituents, and exceed California Action Levels for up to eight (8) organic hazardous constituents. Data from earlier groundwater monitoring indicates that levels of inorganic chemicals in groundwater samples may also exceed Federal MCLs

2.4. The hazardous waste and constituents of concern at the Facility are metals such as lead, cadmium, aluminum, arsenic, sodium, antimony, iron, manganese, zinc; acids [pH], such as sulfuric acid; semi-volatile organic compounds; and, aromatic and halogenated volatile organic compounds such as benzene, ethyl benzene, and trichloroethylene (ICE).

2.5. The Facility is bounded on the south by Bandini Blvd, on the north by 26th street, on the east by Indiana Street (the main office/administration building is east of Indiana Street), and on the west by additional industrial sites. The Facility is bifurcated east to west by the Union Pacific and Santa Fe Railroad and north to south by an open Flood Control channel and a buried storm box culvert. The Facility is located in the southern portion of the Los Angeles Forebay Area of the central Groundwater Basin of the Los Angeles Coastal Plain, approximately 1 mile north of the Los Angeles River. Based on measurements taken on-site, the first ground water encountered beneath the facility is at depths of 85 to 90 feet bgs. In 1991, the local groundwater flow pattern had 180° radius along a southeast-directed axis. However, there are no monitoring wells to the northwest, and

consequently information on flow direction is incomplete. The seventeen (17) groundwater monitoring wells at the Facility are shallow and interconnection with deeper underlying aquifer units, such as the Exposition and Gage, is unknown. The June 13, 1994, Basin Plan of the Los Angeles Regional Water Quality Control Board (LARWQCB) indicates that the ground water beneath the Facility is beneficial for municipal uses.

2.6. Releases from the Facility may migrate through the vadose zone either toward air and/or surface and ground water since some of the contaminants identified in the sampling are mobile in gas-phase.

3.0 PROJECT COORDINATOR

3.1 Within fourteen (14) days of the effective date of this Consent Order, DTSC and Respondent shall each designate a Project Coordinator and shall notify each other in writing of the Project Coordinator selected. Each Project coordinator shall be responsible for overseeing the implementation of this Consent Order and for designating a person to act in his/her absence. All communications between Respondent and DTSC, and all documents, report approvals, and other correspondence concerning activities performed pursuant to this Consent Order shall be directed through the Project Coordinators. Each party may change its Project Coordinator with at least seven (7) days prior written notice.

4.0 WORK TO BE PERFORMED

4.1. Respondent agrees to perform any and all work undertaken pursuant to this Consent Order to the extent applicable and in a manner consistent with: the attached Scopes of Work; DTSC-approved RCRA Facility Investigation Work Plan, Corrective Measures Study Work Plan, and Corrective Measures Implementation Work Plan; and any other work plans submitted by Respondent and approved by DTSC; Public

Participation Policy and Procedures Manual, published by DTSC, as previously amended; H&SC and other applicable state and federal laws and their implementing regulations; and applicable DTSC or U S. EPA guidance documents. Applicable guidance documents include, but are not limited to, the "RCRA Facility Investigation (RFI) Guidance" (Interim Final, May 1989, EPA 530/SW-89-031), "RCRA Groundwater Monitoring Technical Enforcement Guidance Document" (OSWER Directive 9950.1, September 1986), "Test Methods For Evaluating Solid Waste" (SW-846), "Construction Quality Assurance for Hazardous Waste Land Disposal Facilities" (EPA 530/SW-85-031, July 1986), "Corrective Action Orientation Manual" (Draft Working copy, June 1994, DTSC), and the Guidance Manual for Groundwater Investigations (California Environmental protection Agency, July 1995)

5.0 INTERIM MEASURES (IM)

5.1 Respondent shall evaluate available data and assess the need for interim measures in addition to those specifically required by this Consent Order Interim measures shall be used whenever possible to control or abate immediate threats to human health and/or the environment, and to prevent and/or minimize the spread of contaminants while long-term corrective action alternatives are being evaluated.

5.2 Within ninety (90) days of the effective date of this Consent Order, Respondent shall submit a Current Conditions Report in accordance with the scope of work outlined in the letters from Mr. Jeffery Pierce of Integrated Environmental Solutions to Mr. Liang Chiang of DISC, dated September 6, 2001 and October 2, 2001, respectively, and appended hereto as Attachment 1 and Attachment 2

5.3 In the event Respondent identifies an immediate or potential threat to human health and/or the environment, discovers new releases of hazardous waste and/or hazardous waste constituents, or discovers new solid waste management units not previously identified,

Respondent shall notify the DISC Project Coordinator orally within 24 hours of discovery and notify DISC in writing within fifteen (15) calendar days of discovery summarizing the findings, including the immediacy and magnitude of the potential threat to human health and/or the environment. Within thirty (30) calendar days of receiving DTSC's written request, Respondent shall submit to DISC an IM Work Plan for approval. In some instances, where interim measures must be implemented quickly to prevent harm to human health and the environment, DTSC may reduce or limit the elements of, or requirement for, the submittal of work plans and specifications. The IM Work Plan shall include a schedule for submitting to DTSC an IM Operation and Maintenance (O&M) Plan and IM Plans and Specifications. The IM Work Plan, IM O&M Plan, and IM P&S shall be developed in a manner consistent with the Scope of Work for Interim Measures Implementation appended as Attachment 3. If DTSC determines that immediate action is required, the DTSC Project Coordinator may orally authorize the Respondent to act prior to DISC's receipt of the IM Work Plan.

5.4 If DISC identifies an immediate or potential threat to human health and/or the environment, discovers new releases of hazardous waste and/or hazardous waste constituents, or discovers new solid waste management units not previously identified, DTSC will notify Respondent in writing. Within thirty (30) calendar days of receiving DTSC's written notification, Respondent shall submit to DISC for approval an IM Work Plan that identifies Interim Measures that will mitigate the threat. In some instances, where interim measures must be implemented quickly to prevent harm to human health and the environment, DTSC may reduce or limit the elements of, or requirement for, the submittal of work plans and specifications. The IM Work Plan shall include a schedule for submitting to DTSC an IM Operation and Maintenance (O&M)

Plan and IM Plans and Specifications. The IM Work Plan, IM O&M Plan, and IM P&S shall be developed in a manner consistent with the Scope of Work for Interim Measures Implementation appended as Attachment 3. If DTSC determines that immediate action is required, the DTSC Project Coordinator may orally authorize the Respondent to act prior to DTSC's receipt of the IM Work Plan.

5.5 All IM Work Plans shall ensure that the Interim Measures are designed to mitigate current or potential threats to human health and/or the environment, and should, to the extent practicable, be consistent with the objectives of, and contribute to the performance of, any remedy which may be required at the Facility.

5.6 Concurrent with the submission of an IM Work Plan, Respondent shall submit to DTSC a Health and Safety Plan in accordance with the Scope of Work for a Health and Safety Plan, Attachment 4.

5.7 Concurrent with the submission of an IM Work Plan, Respondent shall submit for DTSC's approval a Community Profile in accordance with Attachment 5. Based on the information provided in the Community Profile, if DTSC determines that there is a high level of community concern about the Facility, DISC may require Respondent to prepare a Public Participation Plan or to prepare a supplement to any existing Public Participation Plan.

6.0 RCRA FACILITY INVESTIGATION (RFI)

6.1 The Respondent submitted an RFI Work Plan, dated April 1995, to DTSC for review and approval. The work plan was deemed technically insufficient and has not been approved. Within ninety (90) calendar days of receipt of DISC's comments on the 1995 RFI Work Plan, Respondent shall submit to DTSC a revised Work Plan for a RCRA Facility Investigation ("RFI Work Plan") of the entire Facility, including the SWMUs and AOCs identified in Tables 1 and 2 of section 2.1. The RFI

Work Plan is subject to approval by DTSC and shall be developed in a manner consistent with the Scope of Work for a RCRA Facility Investigation contained in Attachment 6. DTSC will review the Current Conditions Report and RFI Work Plan and notify Respondent in writing of DTSC's approval or disapproval.

6.2 The RFI Work Plan shall detail the methodology to: (1) gather data needed to make decisions on interim measures/ stabilization during the early phases of the RCRA Facility Investigation; (2) identify and characterize all sources of contamination; (3) define the nature, degree and extent of contamination; (4) define the rate of movement and direction of contamination flow; (5) characterize the potential pathways of contaminant migration; (6) identify actual or potential human and/or ecological receptors; and (7) support development of alternatives from which a corrective measure will be selected by DISC. A specific schedule for implementation of all activities shall be included in the RFI Work Plan

6.3 Respondent shall submit a RFI Report to DISC for approval in accordance with DTSC-approved RFI Work Plan schedule. The RFI Report shall be developed in a manner consistent with the Scope of Work for a RCRA Facility Investigation contained in Attachment 6. If there is a phased investigation, separate RFI Report(s) and a report that summarizes the findings from all phases of the RFI must be submitted to DISC. DTSC will review the RFI Report(s) and notify Respondent in writing of DISC's approval or disapproval

6.4 Concurrent with the submission of a RFI Work Plan, Respondent shall submit to DISC a Health and Safety Plan in accordance with Attachment 4. If work plans for both an IM and RFI are required by this Consent Order, Respondent may submit a single Health and Safety Plan that addresses the combined IM and RFI activities.

9.0 CORRECTIVE MEASURES IMPLEMENTATION (CMI).

9.1 Within sixty (60) calendar days of Respondent's receipt of notification of DTSC's selection of the corrective measures, Respondent shall submit to DISC a Corrective Measures Implementation (CMI) Work Plan. The CMI Work Plan is subject to approval by DTSC and shall be developed in a manner consistent with the Scope of Work for Corrective Measures Implementation contained in Attachment 8

9.2 Concurrent with the submission of a CMI Work Plan, Respondent shall submit to DISC a Health and Safety Plan in accordance with Attachment 2.

9.3 The CMI program shall be designed to facilitate the design, construction, operation, maintenance, and monitoring of corrective measures at the Facility. In accordance with the schedule contained in the approved CMI Work Plan, Respondent shall submit to DISC the documents listed below. These documents shall be developed in a manner consistent with the Scope of Work for Corrective Measures Implementation contained in Attachment 8.

- o Operation and Maintenance Plan
- o Draft Plans and Specifications
- o Final Plans and Specifications
- o Construction Work plan
- o Construction Completion Report
- o Corrective Measures Completion Report

9.4 DISC will review all required CMI documents and notify Respondent in writing of DTSC's approval or disapproval

9.5 As directed by DTSC, Respondent shall establish a financial assurance mechanism for Corrective Measures Implementation including operation and maintenance activities. The financial assurance mechanisms may include a performance or surety bond, liability

insurance, an escrow performance guarantee account, a trust fund, financial test, or corporate guarantee as described in Title 22 CCR section 66265.143 or any other mechanism acceptable to DTSC. The mechanism shall be established to allow DISC access to the funds to undertake Corrective Measures Implementation tasks if Respondent is unable or unwilling to undertake the required actions.

10.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT

10.1 DTSC must comply with the California Environmental Quality Act (CEQA) insofar as activities required by this Consent Order are projects subject to CEQA. Respondent shall provide all information necessary to facilitate any CEQA analysis. DTSC will make an initial determination regarding applicability of CEQA. If the activities are not exempt from CEQA, DISC will conduct an Initial Study. Based on the results of the Initial Study, DTSC will determine if a Negative Declaration or an Environmental Impact Report (EIR) should be prepared. DISC will prepare and process any such Negative Declaration. However, should DISC determine that an EIR is necessary, such EIR would be prepared under separate agreement between DISC and Respondent.

11.0 DTSC APPROVAL

11.1 Respondent shall revise any work plan, report, specification, or schedule in accordance with DTSC's written comments. Respondent shall submit to DISC any revised documents by the due date specified by DTSC. Revised submittals are subject to DTSC's approval or disapproval.

11.2 Upon receipt of DTSC's written approval, Respondent shall commence work and implement any approved work plan in accordance with the schedule and provisions contained therein.

11.3 Any Department-approved work plan, report, specification, or schedule required by this Consent Order shall be

deemed incorporated into this Order.

11.4 Verbal advice, suggestions, or comments given by DTSC representatives will not constitute an official approval or decision.

12.0 SUBMITTALS

12.1 Beginning with the first full month following the effective date of this Consent Order, Respondent shall provide DTSC with bi-monthly progress reports of corrective action activities conducted pursuant to this Consent Order. Progress reports are due on the 10th day of the month when reports are due. The progress reports shall conform to the Scope of Work for Progress Reports contained in Attachment 9. DTSC may adjust the frequency of progress reporting to be consistent with site-specific activities.

12.2 Any report or other document submitted by Respondent pursuant to this Consent Order shall be signed and certified by the project coordinator, a responsible corporate officer, or a duly authorized representative.

12.3 The certification required above, shall be in the following form:

> I certify that the information contained in or accompanying this submittal is true, accurate, and complete. As to those portions of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared at my direction in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted.
>
> Signature: _____
> Name: _____
> Title: _____
> Date: _____

12.4 Respondent shall provide three copies of all documents, including but not limited to, work plans, reports, and correspondence of fifteen (15) pages or longer. Submittals specifically exempted from this copy requirement are all progress reports and

correspondence of less than 15 pages, of which one copy is required.

12.5 Unless otherwise specified, all reports, correspondence, approvals, disapprovals, notices, or other submissions relating to this Consent Order shall be in writing and shall be sent to the current Project Coordinators.

13.0 PROPOSED CONTRACTOR/CONSULTANT

13.1 All work performed pursuant to this Consent Order shall be under the direction and supervision of a professional engineer or registered geologist, registered in California, with expertise in hazardous waste site cleanup. Respondent's contractor or consultant shall have the technical expertise sufficient to fulfill his or her responsibilities. Within forty-five (45) days of the effective date of this Consent Order, Respondent shall notify the DTSC Project Coordinator in writing of the name, title, and qualifications of the professional engineer or registered geologist and of any contractors or consultants and their personnel to be used in carrying out the requirements of this Order.

14.0 ADDITIONAL WORK

14.1 DTSC may determine or Respondent may propose that certain tasks, including investigatory work, engineering evaluation, or procedure/methodology modifications, are necessary in addition to, or in lieu of, the tasks and deliverables included in any part of DISC-approved work plans. DTSC shall request in writing that Respondent perform the additional work and shall specify the basis and reasons for DISC's determination that the additional work is necessary. Within sixty (60) days after the receipt of such determination, Respondent may confer with DTSC to discuss additional work that DTSC has requested. If required by DISC, Respondent shall submit a work plan for the additional work. Such work plan shall be submitted to DTSC within thirty (30)

6 5 Respondent shall submit a RFI Summary Fact Sheet to DTSC that summarizes the findings from all phases of the RFI. The RFI Summary Fact Sheet shall be submitted to DTSC in accordance with the schedule contained in the approved RFI Work Plan. DTSC will review the RFI Summary Fact Sheet and notify Respondent in writing of DTSC's approval or disapproval, including any comments and/or modifications When DISC approves the RFI Summary Fact Sheet, Respondent shall mail the approved RFI Summary Fact Sheet to all individuals on the Facility mailing list established pursuant to 22 Cal Code Reg. section 66271 9(c)(1)(D), within fifteen (15) calendar days of receipt of written approval.

6.6 Concurrent with the submittal of the RFI Work Plan, Respondent shall submit to DTSC a Risk Assessment Workplan for the Facility. Respondent shall submit to DTSC a Risk Assessment Report in accordance with the DTSC-approved Risk Assessment Workplan schedule

7.0. CORRECTIVE MEASURES STUDY (CMS)

7 1 Respondent shall prepare a Corrective Measures Study if contaminant concentrations exceed the health-based action levels established by the Risk Assessment Report and/or if DISC determines that the contaminant releases pose a potential threat to human health and/or the environment.

7.2 Within sixty (60) calendar days of DISC's approval of the RFI Report or of Respondent's receipt of a written request from DISC, Respondent shall submit a CMS Work plan to DTSC. The CMS Work plan is subject to approval by DTSC and shall be developed in a manner consistent with the Scope of Work for a Corrective Measures Study contained in Attachment 7.

7.3 The CMS Work Plan shall detail the methodology for developing and evaluating potential corrective measures to remedy any

contamination at the Facility The CMS Work plan shall identify the potential corrective measures, including any innovative technologies, that may be used for the containment, treatment, remediation, and/or disposal of contamination

7.4 Respondent shall prepare treatability studies for all potential corrective measures that involve treatment except where Respondent can demonstrate to DTSC's satisfaction that they are not needed. The CMS Work Plan shall include, at a minimum, a summary of the proposed treatability study including a conceptual design, a schedule for submitting a treatability study work plan, or Respondent's justification for not proposing a treatability study

7 5 Respondent shall submit a CMS Report to DISC for approval in accordance with DTSC-approved CMS Work plan schedule The CMS Report shall be developed in a manner consistent with the Scope of Work for a Corrective Measures Study contained in Attachment 7. DTSC will review the CMS Report and notify Respondent in writing of DISC's approval or disapproval.

8.0 REMEDY SELECTION

8 1 DTSC will provide the public with an opportunity to review and comment on the final draft of the CMS Report, DTSC's proposed corrective measures for the Facility, and DTSC's justification for selection of such corrective measures.

8 2 Following the public comment period, DTSC may select final corrective measures or may require Respondent to revise the CMS Report and/or perform additional corrective measures studies.

8 3 DTSC will notify Respondent of the final corrective measures selected by DISC in the Final Decision and Response to Comments. The notification will include DTSC's reasons for selecting the corrective measures

calendar days of receipt of DTSC's determination or according to alternate schedule established by DTSC. Upon approval of a work plan, Respondent shall implement it in accordance with the provisions and schedule contained therein. The need for, and disputes concerning, additional work are subject to the dispute resolution procedures specified in this Consent Order.

15.0 QUALITY ASSURANCE

15.1 All sampling and analyses performed by Respondent under this Consent Order shall follow applicable Department and U.S. EPA guidance for sampling and analysis. Work plans shall contain quality assurance/quality control and chain-of-custody procedures for all sampling, monitoring, and analytical activities. Any deviations from the approved work plans must be approved by DISC prior to implementation, must be documented, including reasons for the deviations, and must be reported in the applicable report (e.g., RFI Report).

15.2 The names, addresses, and telephone numbers of the California State certified analytical laboratories Respondent proposes to use must be specified in the applicable work plans.

15.3 All work plans required under this Consent Order shall include data quality objectives for each data collection activity to ensure that data of known and appropriate quality are obtained and that data are sufficient to support their intended uses.

15.4 Respondent shall monitor to ensure that high quality data are obtained by its consultant or contract laboratories. Respondent shall ensure that laboratories used by Respondent for analysis perform such analysis according to the latest approved edition of "Test Methods for Evaluating Solid Waste, (SW-846)", or other methods deemed satisfactory to DISC. If methods other than U.S. EPA methods are

to be used, Respondent shall specify all such protocols in the applicable work plan (e g , RFI Work Plan) DISC may reject any data that do not meet the requirements of the approved work plan, USEPA analytical methods, or quality assurance/quality control procedures, and may require re-sampling and analysis

15 5 Respondent shall ensure that the laboratories used by Respondent for analyses have a quality assurance/quality control program certified through the California State Department of Health Services Environmental Laboratory Accreditation Program (ELAP) DISC may conduct a performance and quality assurance/quality control audit of the laboratories chosen by Respondent before, during, or after sample analyses Upon request by DISC, Respondent shall have its selected laboratory perform analyses of samples provided by DISC to demonstrate laboratory performance If the audit reveals deficiencies in a laboratory's performance or quality assurance/quality control procedures, re-sampling and analysis may be required

16.0 SAMPLING AND DATA/DOCUMENT AVAILABILITY

16 1 Respondent shall submit to DISC upon request the results of all sampling and/or tests or other data generated by its employees, agents, consultants, or contractors pursuant to this Consent Order

16 2 Notwithstanding any other provisions of this Consent Order, DISC retains all of its information gathering and inspection authority and rights, including enforcement actions related thereto, under the H&SC, and any other state or federal statutes or regulations

16 3 Respondent shall notify DISC in writing at least seven (7) calendar days prior to beginning each separate phase of field work approved under any work plan required by this Consent Order If Respondent believes it must commence emergency field activities without

delay, Respondent may seek emergency telephone authorization from the DTSC Project Coordinator or, if the Project Coordinator is unavailable, his/her Branch Chief, to commence such activities immediately.

16.4 At the request of DTSC, Respondent shall provide or allow DTSC or its authorized representative to take split or duplicate samples of all samples collected by Respondent pursuant to this Consent Order. Similarly, at the request of Respondent, DTSC shall allow Respondent or its authorized representative to take split or duplicate samples of all samples collected by DTSC under this Consent Order.

17.0 ACCESS

17.1 Subject to the Facility's security and safety procedures, Respondent shall provide DTSC and its representatives access at all reasonable times to the Facility and any other property to which access is required for implementation of this Consent Order and shall permit such persons to inspect and copy all records, files, photographs, documents, including all sampling and monitoring data, that pertain to work undertaken pursuant to this Consent Order and that are within the possession or under the control of Respondent or its contractors or consultants.

17.2 To the extent that work being performed pursuant to this Consent Order must be done beyond the Facility property boundary, Respondent shall use its best efforts to obtain access agreements necessary to complete work required by this Consent Order from the present owners of such property within thirty (30) calendar days of approval of any work plan for which access is required. Best efforts as used in this paragraph shall include, at a minimum, a letter by certified mail from Respondent to the present owners of such property requesting an agreement to permit Respondent and DTSC and its authorized representatives access to such property and offering the payment by

Respondent of reasonable sums of money in consideration of granting access. Any such access agreement shall provide for access to DTSC and its representatives. Respondent shall provide DTSC's Project Coordinator with a copy of any access agreements. In the event that an agreement for access is not obtained within thirty (30) calendar days of approval of any work plan for which access is required, or of the date that the need for access becomes known to Respondent, Respondent shall notify DTSC in writing within fourteen (14) calendar days thereafter regarding both the efforts undertaken to obtain access and its failure to obtain such agreements. DTSC may, at its discretion, assist Respondent in obtaining access.

17.3 Nothing in this section limits or otherwise affects DTSC's right of access and entry pursuant to any applicable state or federal law or regulation.

17.4 Nothing in this Consent Order shall be construed to limit or otherwise affect Respondent's liability and obligation to perform corrective action including corrective action beyond the Facility boundary.

18.0 RECORD PRESERVATION

18.1 Respondent shall retain, during the implementation of this Consent Order and for a minimum of six (6) years thereafter, all data, records, and documents that relate in any way to the implementation of this Consent Order or to hazardous waste management and/or disposal at the Facility. Respondent shall notify DTSC in writing ninety (90) calendar days prior to the destruction of any such records, and shall provide DTSC with the opportunity to take possession of any such records. Such written notification shall reference the effective date, caption, and docket number of this Consent Order and shall be addressed to:

Jose Kou, Chief
Southern California Permitting Branch
Department of Toxic Substances Control
1011 North Grandview Avenue
Glendale, CA 91201

18.2 If Respondent retains or employs any agent, consultant, or contractor for the purpose of complying with the requirements of this Consent Order, Respondent will require any such agents, consultants, or contractors to provide Respondent a copy of all documents produced pursuant to this Consent Order.

18.3 All documents pertaining to this Consent Order shall be stored in a central location at the Facility to afford ease of access by DTSC and its representatives.

19.0 DISPUTE RESOLUTION

19.1 The parties agree to use their best efforts to resolve all disputes informally. The parties agree that the procedures contained in this section are the required administrative procedures for resolving disputes arising under this Consent Order. If the Respondent fails to follow the procedures contained in this section, it shall have waived its right to further contest the disputed issue. Respondent reserves its legal rights to contest or defend against any final decision rendered by DTSC under this paragraph. Disputes regarding DTSC's billings shall follow the procedures set forth in paragraph 19.4.

19.2 Respondent shall first seek resolution with DTSC's assigned project manager and unit chief. If the issue is not resolved after review by the unit chief, the Respondent shall seek resolution with the DTSC's branch chief by presenting in a letter the issues in dispute, the legal or other basis for Respondent's position, and the remedy sought. The branch chief shall issue a written decision with an explanation for the decision within thirty (30) business days after receipt of the letter from the Respondent. The branch chief's decision

shall constitute DTSC's final administrative decision on the issues in dispute.

19.3 If Respondent disputes a DTSC billing, or any part thereof, Respondent shall notify DTSC's assigned project manager and attempt to informally resolve the dispute with DTSC's project manager and branch chief. If Respondent desires to formally request dispute resolution in writing within forty five (45) business days of the date of the billing in dispute. The written request shall describe all issues in dispute and shall set forth the reasons for the dispute, both factual and legal. If the dispute pertains only to a portion of the costs included in the invoice, Respondent shall pay all costs which are undisputed in accordance with paragraphs 23.1 through 23.7. The filing of a notice of dispute pursuant to this Section shall not stay the accrual of interest on any unpaid costs pending resolution of the dispute. The written request shall be sent to:

Special Assistant for Cost Recovery and Reimbursement Policy
Department of Toxic Substances Control
P.O. Box 806
Sacramento, CA 95812-0806

A copy of the written request for dispute resolution shall also be sent to the person designated by DTSC to receive submittals under this Consent Order. A final decision on the billing dispute will be rendered by the Special Assistant for Cost Recovery and Reimbursement Policy or other DTSC designee.

19.4 The existence of a dispute shall not excuse, stay, or suspend any other compliance obligation or deadline required pursuant to this Consent Order.

20.0 RESERVATION OF RIGHTS

20.1 DTSC reserves all of its statutory and regulatory

powers, authorities, rights, and remedies, both legal and equitable, which may pertain to Respondent's failure to comply with any of the requirements of this Consent Order. Correspondingly, Respondent reserves all of its statutory and administrative rights, defenses and remedies, both legal and equitable, as they may arise under this Consent Order. This Consent Order shall not be construed as a covenant not to sue, release, waiver, or limitation on any rights, remedies, powers, defenses or authorities, civil or criminal or administrative, that DTSC or Respondent may have under any laws, regulations or common law.

20.2 DTSC reserves the right to disapprove of work performed by Respondent pursuant to this Consent Order and to request that Respondent perform additional tasks.

20.3 DTSC reserves the right to perform any portion of the work consented to herein or any additional site characterization, feasibility study, and/or remedial actions it deems necessary to protect human health and/or the environment. DTSC may exercise its authority under any applicable state or federal law or regulation to undertake response actions at any time. DTSC reserves its right to seek reimbursement from Respondent for costs incurred by the State of California with respect to such actions. DTSC will notify Respondent in writing as soon as practicable regarding the decision to perform any work described in this section.

20.4 If DTSC determines that activities in compliance or noncompliance with this Consent Order have caused or may cause a release of hazardous waste constituents, or a threat to human health and/or the environment, or that Respondent is not capable of undertaking any of the work required, DTSC may order Respondent to stop further implementation of this Consent Order for such period of time as DTSC determines may be needed to abate such release or threat. The deadlines for any actions

required of Respondent under this Consent Order affected by the order shall be extended to take into account DTSC's actions.

20.5 This Consent Order is not intended to be nor shall it be construed to be a permit. The parties acknowledge and agree that DTSC's approval of any work plan, plan, and/or specification does not constitute a warranty or representation that the work plans, plans, and/or specifications will achieve the required cleanup or performance standards. Compliance by Respondent with the terms of this Consent Order shall not relieve Respondent of its obligations to comply with the H&SC or any other applicable local, state or federal law regulation.

21.0 OTHER CLAIMS

21.1 Except as provided in this Consent Order, nothing in this Consent Order shall constitute or be construed as a release from any claim, cause of action, or demand in law or equity against any person, firm, partnership, or corporation for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous constituents, hazardous wastes, pollutants, or contaminants found at, taken to, or taken or migrating from the Facility. Respondent waives any claims or demands for compensation or payment from the State California arising out of any activity performed or expense incurred by Respondent pursuant to this Consent Order.

22.0 OTHER APPLICABLE LAWS

22.1 All actions required to be taken pursuant to this Consent Order shall be undertaken in accordance with the requirements of local, state, and federal laws and regulations. Respondent shall obtain or cause its representatives to obtain all permits and approvals necessary under such laws and regulations.

23.0 REIMBURSEMENT OF DTSC'S COSTS

23.1 Respondent shall pay all of DTSC's costs incurred in the implementation of this Consent Order. Such costs shall include DTSC's costs incurred in the preparation of this Consent Order prior to the date it is signed.

23.2 An estimate of DTSC's costs is attached as Exhibit A showing the amount of $167,938.00. It is understood by the parties that the amount in Exhibit A is only an estimate for those activities shown in Exhibit A for the first calendar year after the effective date of this Consent Order, and may differ from the actual costs incurred by DTSC in overseeing those activities. DTSC will provide additional cost estimates for the subsequent phases of work as the work progresses.

23.3 Respondent shall make an advance payment to DTSC in the amount of $40,000.00 within thirty (30) calendar days of the effective date of this Consent Order. If the advance payment exceeds DTSC's costs, DTSC will refund the balance within one hundred twenty (120) calendar days after the execution of the Acknowledgment of Satisfaction (Acknowledgment) pursuant to Paragraph 26 of this Consent Order.

23.4 After the advance payment, DTSC will provide Respondent with a billing statement at least quarterly, which will include the name of the employee, identification of the activity, the amount of time spent on each activity, and the hourly rate charged. If Respondent does not pay an invoice within sixty (60) calendar days, the amount is subject to interest as provided in HSC section 25360.1.

23.5 DTSC will retain all cost records associated with the work performed under the Consent Order as required by state law. DTSC will make all documents which support DTSC's cost determination available for inspection upon Respondent's request, as provided by the Public Records Act.

23.6 Any dispute concerning costs pursuant to this Consent Order is subject to the Dispute Resolution provision of this Consent Order. DTSC reserves its right to recover unpaid costs under applicable state and federal laws.

23.7 All payments shall be made within thirty (30) calendar days of the date of the billing statement by check payable to the Department of Toxic Substances Control and shall be sent to:

Accounting Unit

Department of Toxic Substances Control

P.O. Box 806

Sacramento, California 95812-0806

All checks shall reference the name of the Facility, Respondent=s name and address, and the docket number of this Consent Order. Copies of all checks and letters transmitting such checks shall be sent simultaneously to DISC's project coordinator.

24.0 MODIFICATION

24.1 This Consent Order may be modified by mutual agreement of the parties. Any agreed modifications shall be in writing, shall be signed by both parties, shall have as their effective date the date on which they are signed by DTSC, and shall be deemed incorporated into this Consent Order.

24.2 Any requests for revision of an approved work plan requirement must be in writing. Such requests must be timely and provide justification for any proposed work plan revision. DTSC has no obligation to approve such requests, but if it does, such approval will be in writing and signed by the Chief, Southern California Permitting Branch, Department of Toxic Substances Control, Region or his or her designee. Any approved work plan modification shall be incorporated by reference into this Consent Order.

25.0 SEVERABILITY

25.1 The requirements of this Consent Order are severable, and Respondent shall comply with each and every provision hereof, notwithstanding the effectiveness of any other provision.

26.0 TERMINATION AND SATISFACTION

26.1 The provisions of this Consent Order shall be deemed satisfied upon the execution by both parties of an Acknowledgment of Satisfaction (Acknowledgment). DISC will prepare the Acknowledgment for Respondent's signature. The Acknowledgment will be executed when Respondent has demonstrated completion of the work required under this Consent Order and full payment of DTSC's costs incurred under this Consent Order. The Acknowledgment will affirm Respondent's continuing obligation to preserve all records after the rest of the Consent Order is satisfactorily completed.

27.0 COUNTERPARTS

27.1 This Consent Order may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document.

28.0 FULL AND COMPLETE AGREEMENTS

28.1 This Consent Order contains all of the covenants and agreements between DTSC and Respondent with respect to the subject matter of this Consent Order. Each Party to this Consent Order acknowledges that no representations, inducements, promises, or agreements have been made by or on the behalf of any party except those covenants and agreements embodied in this Consent Order.

29.0 CHANGE IN OWNERSHIP

29.1 No change in ownership or corporate or partnership status relating to the Facility shall in any way alter Respondent's

responsibility under this Consent Order. No conveyance of title, easement, or other interest in the Facility, or a portion of the Facility, shall affect Respondent's obligations under this Consent Order. However, DTSC may consent to the transfer of such obligations to a third party, and DTSC shall not unreasonably withhold its consent Respondent shall be responsible for and liable for any failure to carry out all activities required of Respondent by the terms and conditions of this Consent Order, regardless of Respondent's use of employees, agents, contractors, or consultants to perform any such tasks.

30.0 NOTICE TO CONTRACTORS AND SUCCESSORS

30.1 Respondent shall provide a copy of this Consent Order to all contractors, laboratories, and consultants retained to conduct or monitor any portion of the work performed pursuant to this Consent Order and shall condition all such contracts on compliance with the terms of this Consent Order. Respondent shall give written notice of this Consent Order to any successor in interest prior to transfer of ownership or operation of the Facility and shall notify DTSC at least seven (7) calendar days prior to such transfer.

31.0 SUBMITTAL SUMMARY

31.1 Below is a summary of the major reporting requirements contained in this Consent Order. The summary is provided as a general guide and does not contain all requirements. Please refer to the specific language of this Consent Order for all the requirements.

Section	Action	Due Date
4.2	Implement approved work plans	In accordance with schedules contained in approved work plans
4.1	Designate Project Coordinator and notify DTSC in writing	14 days from effective date of Order
5.3	Notify DTSC orally of	24 hours after

	potential threats to human health	discovery
5.3	Notify DTSC in writing of potential threats to human health	15 days after discovery
5.2 5.6 5.7	Submit Current Conditions Report Health and Safety Plan, Community Profile	90 days from effective date of Order
6.1 6.4 6.6	Submit revised RFI Work Plan, Health and Safety Plan Health and Safety Plan	90 days from receipt of DTSC comments
7.2	Submit CMS Work Plan	60 days after DISC's approval of RFI Report
9.1	Submit CMI Work Plan	60 days from receipt of notification of DTSC selection of corrective measure(s)
12.1	Submit first Progress Report	10th day of the month following the effective date of Order
12.1	Submit Progress Reports	Every two months
13.1	Notify DISC in writing of contractors to carry out terms of Order	45 days from effective date of Order
16.3	Notify DTSC of initiation of field work	7 days before each phase of field work

32.0 EFFECTIVE DATE

32.1 The effective date of this Consent Order shall be the date on which this Consent Order is signed by all parties. Except as otherwise specified, days mean calendar days.

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32.0 SIGNATORIES

33 1 Each undersigned representative certifies that he or she is fully authorized to enter this Consent Order.

IT IS SO AGREED AND ORDERED:

EXIDE CORPORATION

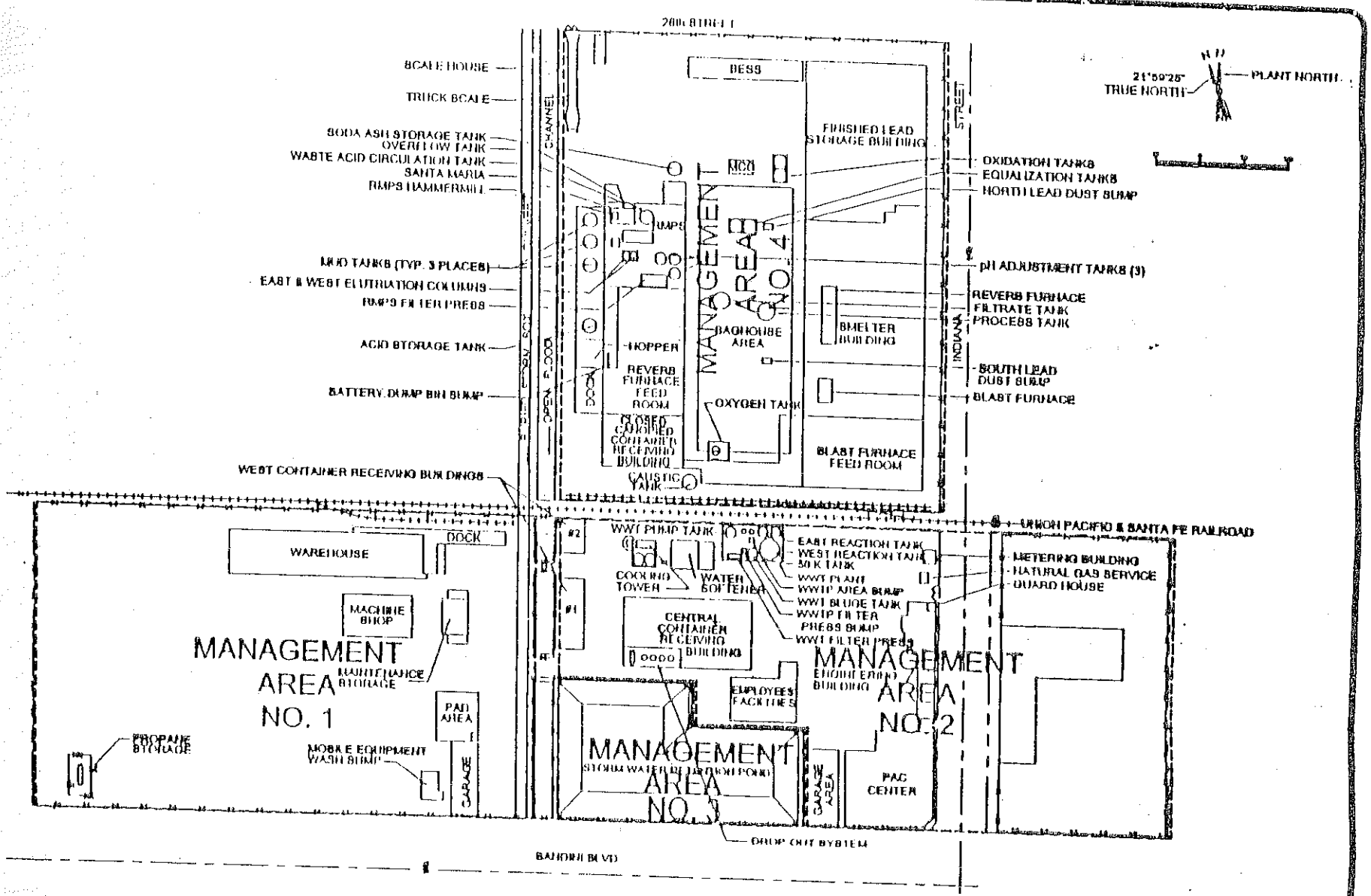
Date: 2-18-02

Print name and title

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Date: 2/25/02

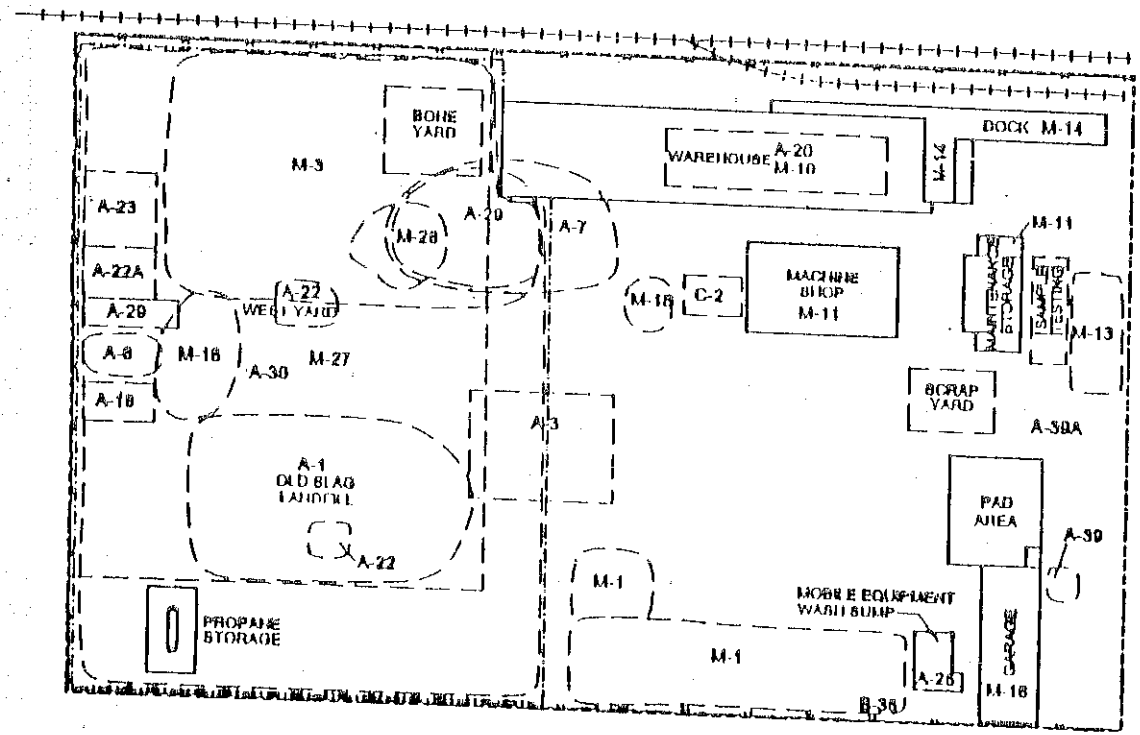
Print name and title

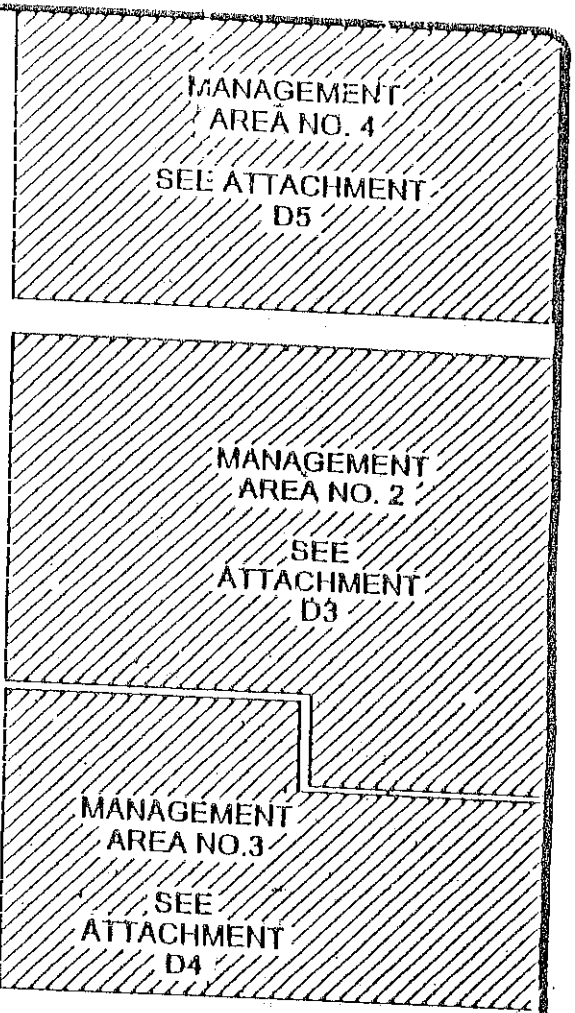


DESIGNATED WASTE MANAGEMENT AREAS

GNB TECHNOLOGIES INC. - VERNON, CA

FIGURE 1

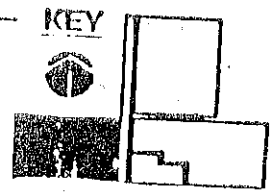




SCALE 1"=100'

BANDINI BLVD.

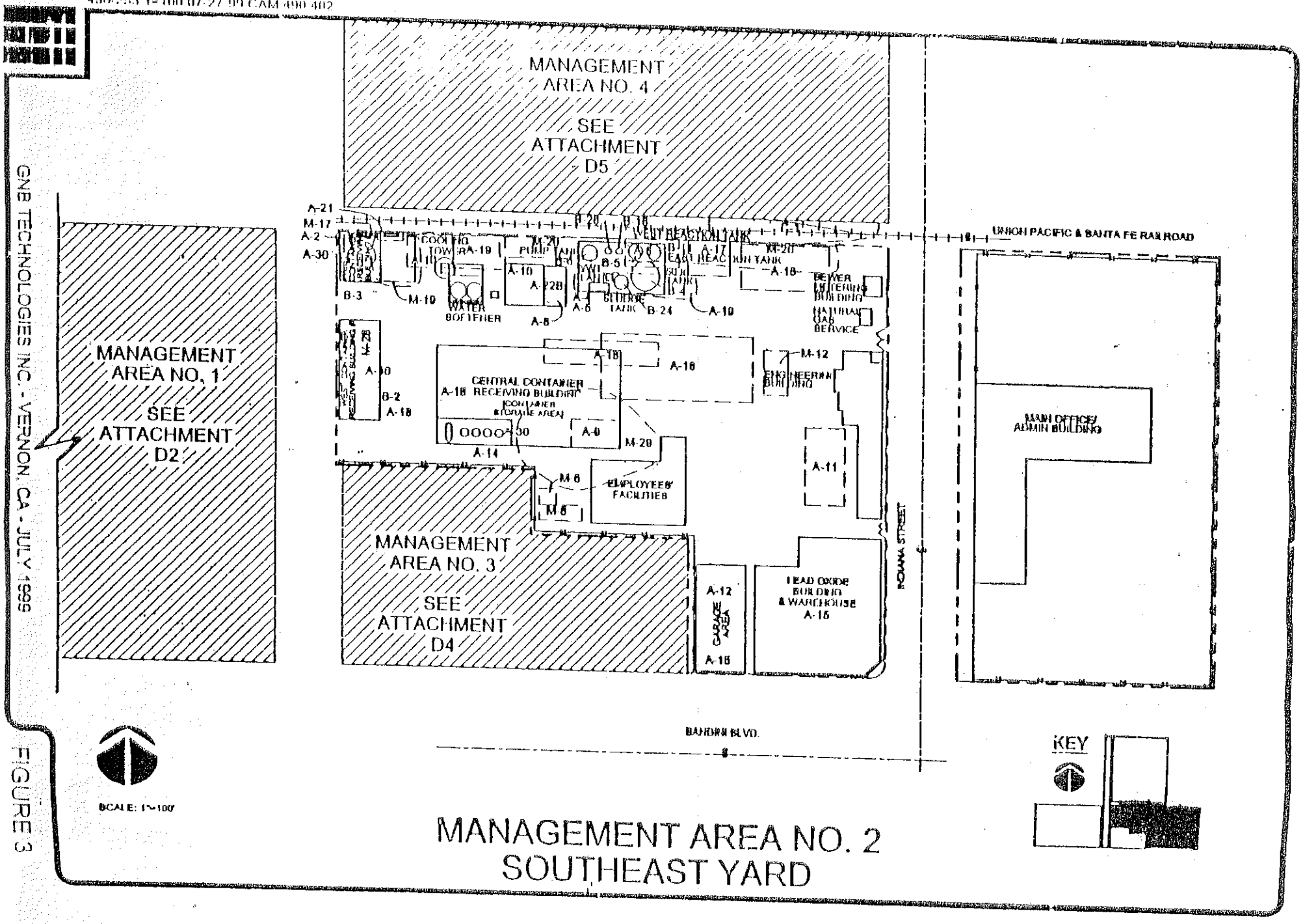
KEY



MANAGEMENT AREA NO. 1
WEST YARD

GNS TECHNOLOGIES INC. - VERNON, CA.

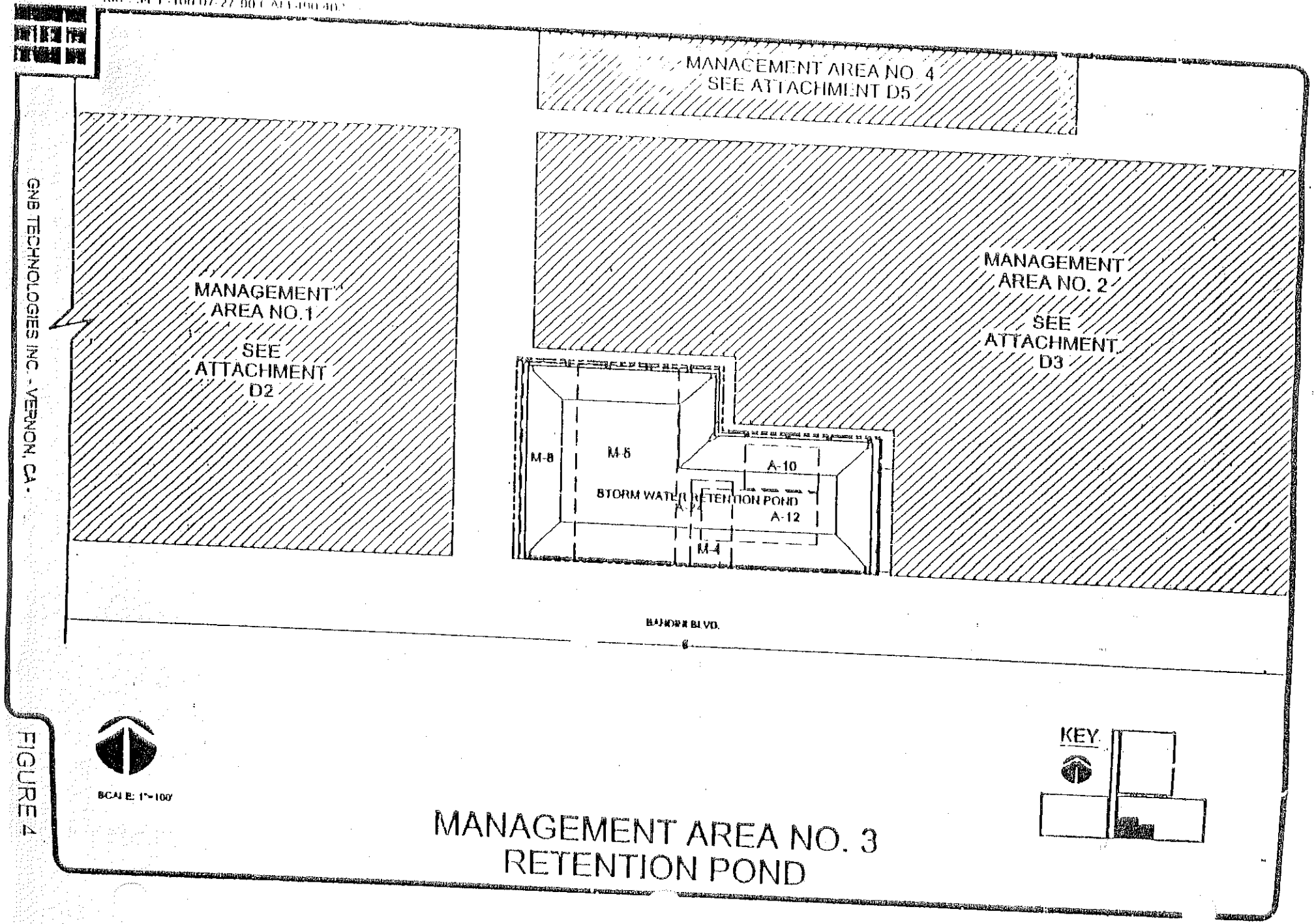
FIGURE 2



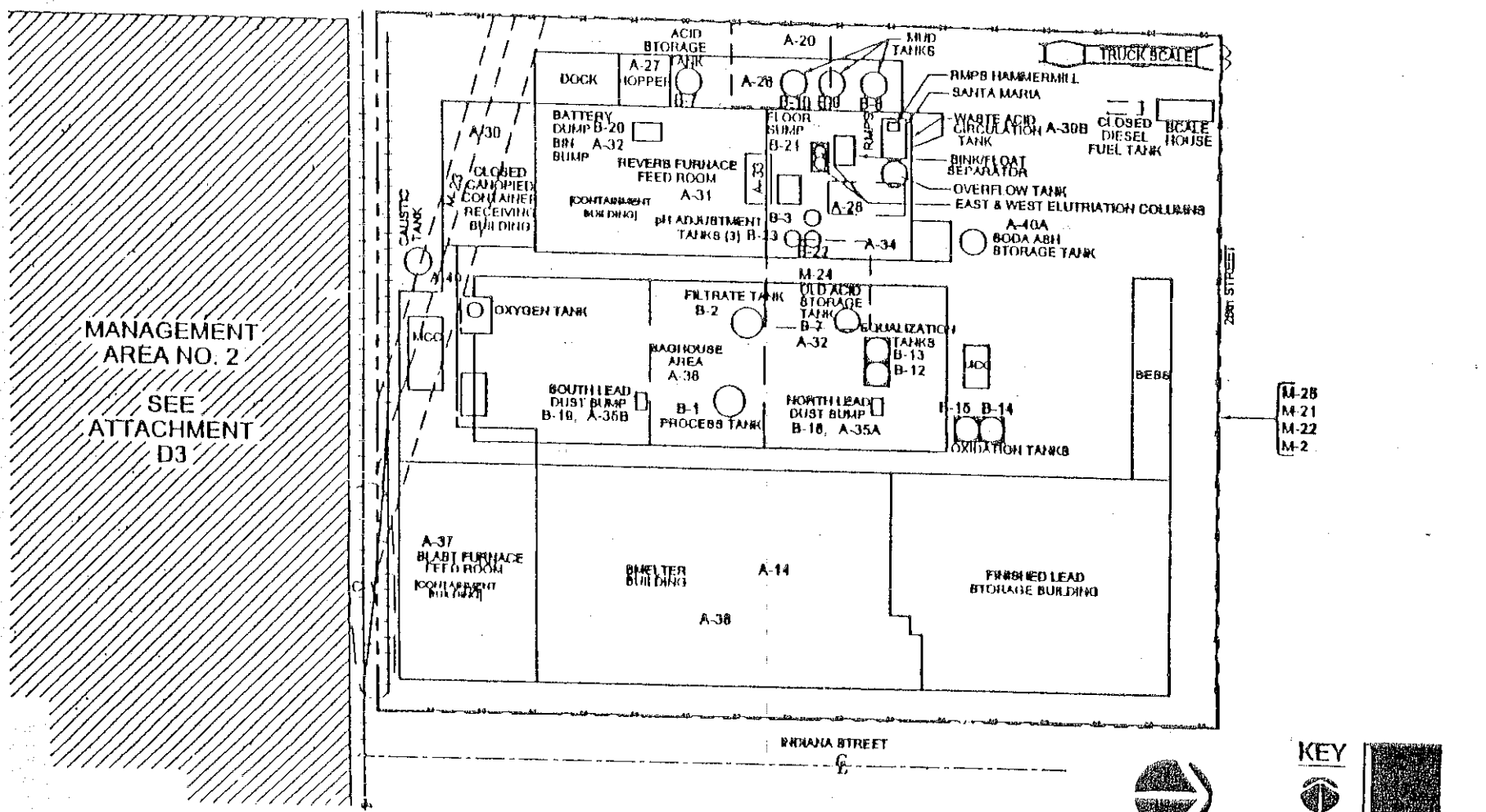
GNB TECHNOLOGIES INC. - VERNON, CA - JULY 1999

FIGURE 3

MANAGEMENT AREA NO. 2
SOUTHEAST YARD


MANACEMENT AREA NO. 4
SEE ATTACHMENT D5
MANAGEMENT AREA NO. 1
SEE ATTACHMENT D2
MANAGEMENT AREA NO. 2
SEE ATTACHMENT D3
M-8
M-5
A-10
STORM WATER RETENTION POND
A-12
M-4
BAUMAN BLVD.
KEY
SCALE: 1"=100'
GNB TECHNOLOGIES INC. - VERNON, CA.
FIGURE 4
MANAGEMENT AREA NO. 3
RETENTION POND

490 255 i=100 07 27-89 CAM 490 402



GNB TECHNOLOGIES INC. - VERNON, CA

FIGURE 5

MANAGEMENT AREA NO. 4
NORTH EAST YARD

EXHIBIT A

I. RFI Workplan Review

Project Manager reviews the Current Conditions Report, RFI Workplan, Health and Safety Plan, prepares and issues a Notice of Deficiency (NOD); reviews and approves revised RFI Workplan, and Current Condition Report; coordinates with Public Participation staff in the preparation of a Public Involvement Plan (PIP) or RFI Summary Fact Sheet.

COST ESTIMATE FOR REVIEW AND APPROVAL OF RFI WORK PLAN			
	HOURS	HOURLY RATE + INDIRECT @ 191.68%	AMOUNT
Project Manager - HSE	200	$122.00	$24,400.00
Supervisor - SHSEG I	120	$134.00	$16,080.00
Geologist - HSEG	80	$116.00	$9,280.00
Sup. Geologist- SHSEG I	24	$134.00	$3,216.00
Asso. Industrial Hygienist	32	$115.00	$3,680.00
Sup. Industrial Hygienist	16	$131.00	$2,096.00
Public Partici. Specialist	40	$103.00	$4,120.00
Public Partici. Supervisor	16	$118.00	$1,888.00
Word Processing Tech.	24	$57.00	$1,368.00
SUBTOTAL	552		$66,128.00

II. RFI Oversight

Project Manager visits the facility to take split samples, and review progress reports

COST ESTIMATE FOR RFI OVERSIGHT			
	HOURS	HOURLY RATE + INDIRECT @ 191.68%	AMOUNT
Project Manager - HSE	80	$122.00	$9,760.00
Supervisor - SHSEG I	32	$134.00	$4,288.00
Geologist - HSEG	32	$116.00	$3,712.00
Sup. Geologist- SHSEG I	16	$134.00	$2,144.00
Asso. Industrial Hygienist	16	$115.00	$1,840.00
Sup. Industrial Hygienist	8	$131.00	$1,048.00
Word Processing Tech.	24	$57.00	$1,368.00
SUBTOTAL	208		$24,160.00

III. RFI Report Review/Approval

Project Manager reviews RFI Report, issues NOD, reviews/ approves revised RFI Report and determines whether Corrective Measure Study (CMS), Interim Measure (IM), or no further action is warranted.

COST ESTIMATE FOR REVIEW AND APPROVAL OF RFI REPORT			
	HOURS	HOURLY RATE + INDIRECT @ 196.54%	AMOUNT
Project Manager - HSE	120	$122.00	$14,640.00
Supervisor - SHSEG I	60	$134.00	$8,040.00
Geologist - HSEG	32	$116.00	$3,712.00
Sup. Geologist- SHSEG I	16	$134.00	$2,144.00
Asso. Industrial Hygienist	24	$115.00	$2,760.00
Sup. Industrial Hygienist	8	$131.00	$1,048.00
Public Partici. Specialist	32	$103.00	$3,296.00
Public Partici. Supervisor	16	$118.00	$1,888.00
Word Processing Tech.	24	$57.00	$1,368.00
SUBTOTAL	332		$38,896.00

SUMMARY

I. RFI Workplan Review	$	66,128 00
II. RFI Oversight	$	24,160.00
III. RFI Report Review/Approval	$	38,896.00
SUBTOTAL	$	129,184 00
10% Project Management	$	12,918.00
20% Contingency	$	25,836 00
TOTAL ESTIMATED COST	$	167,938.00

RMT Integrated Environmental Solutions

ATTACHMENT 1

3543-1

8607 Roberts Drive
Suite 100
Atlanta, GA 30350
Telephone: 770-641-9756
Fax: 770-642-0257

September 6, 2001

Mr. Liang Chiang, P.E.
Hazardous Substance Engineer
California Environmental Protection Agency
Department of Toxic Substances Control
Region 3/Facility Management Branch
1011 N. Grandview Avenue
Glendale, California 91201

Re: Contents of the Corrective Action Consent Order Required Current Conditions Report
Exide Technologies' Vernon, California Facility
EPA ID No. CAD 097 854 541

Dear Liang:

Per our discussions on July 18, 2001 about the contents of the Current Conditions Report (CCR) required as part of the Corrective Action Consent Order (CACO) with Exide Technologies' Vernon, California facility, I wanted to verify that the streamlined approach that Exide proposes to use to address the CCR requirement is satisfactory to the Department of Toxic Substances Control (DTSC). This letter serves as an agreement that the approach is sufficient to meet this requirement of the CACO. As we discussed, the language in the CACO has been agreed upon by Exide and DTSC, and is ready for signature once agreement is reached on the contents of the CCR. From our conversation, I understand that DTSC does not necessarily expect that the CCR will strictly follow the outline given in the CACO appendix.

Exide appreciates the opportunity to provide an alternative approach for preparing the CCR rather than strictly following the outline presented in the appendix of the CACO. Exide's streamlined approach for preparation of the CCR will include the following:

- A facility description that includes past and current operations;
- A facility history that includes ownership, operational, and regulatory history;
- A description of the past and current waste streams (solid and hazardous) generated at the facility;
- A description of all past waste management units and current permitted units, including any units or activities that were identified in negotiating cost recovery allocations with the prior owner/operator;
- The history of any spills and discharges at the facility;
- A brief description of surface drainage, surface water hydrology, geology, and hydrogeology;
- A detailed description of the facility groundwater monitoring system that includes a summary of the monitor well construction details, historical analytical data, and concentration maps;

Thomas J.P. McNelly

- A brief description of previous investigations conducted at the facility with a presentation of the available data;
- A brief summary of the physical properties of the contaminants detected at the facility;
- A conceptual model of potential contamination migration;
- A description of all corrective measures conducted at the facility; and
- An assessment of the data needs to be addressed in the revised RCRA Facility Investigation (RFI) Work Plan.

The objective of this approach is to provide DTSC with all of the available information needed to facilitate the review of the previously submitted RFI Work Plan, thus providing comments for the revised RFI Work Plan as required by the CACO. Exide understands that the information omitted from the CCR outline in the CACO to prepare the streamlined CCR needs to be incorporated into the revised RFI Work Plan, which will be submitted after receiving and incorporating DTSC comments.

Exide would appreciate DTSC's approval of this streamlined approach so that the CACO can be signed and the corrective action process initiated.

Please call me if you have any comments or questions concerning the contents of this letter.

Sincerely,

Jeffery A. Pierce, P.E.
Senior Project Manager

JAP:smr

cc: Fred Ganster – Exide Technologies, Reading, Pennsylvania
Tom McHenry – Gibson, Dunn & Crutcher
Tom Wideman – Exide Technologies, Vernon, California
Russell Kemp – RMT, Inc., Atlanta, Georgia
Central Files

RMT
Integrated Environmental Solutions
3607 Roberts Drive
Suite 100
Atlanta, GA 30350
Telephone: 770-641-9756
Fax: 770-642-0257

ATTACHMENT 2

October 2, 2001

Mr. Liang Chiang, P.E.
Hazardous Substance Engineer
California Environmental Protection Agency
Department of Toxic Substances Control
Region 3/Facility Management Branch
1011 N. Grandview Avenue
Glendale, California 91201

OCT 04 2001
RECEIVED

Re: Contents of the Corrective Action Consent Order Required Current Conditions Report
Exide Technologies' Vernon, California Facility
EPA ID No. CAD 097 854 541

Dear Liang:

RMT, Inc. is pleased to submit this letter to confirm the approval by Department of Toxic Substances Control (DTSC) of the proposed content of the Current Conditions Report (CCR) required as part of the Corrective Action Consent Order with Exide Technologies' Vernon, California facility. The approval was given for the streamline approach detailed in the September 6, 2001 letter from RMT to DTSC with the inclusion of a study of all previously permitted units that were taken out of service and whether they are being formally closed with a certification report.

If DTSC has any additional comments concerning the streamlined approach, please contact me within 14 days or we will assume that the proposed approach with the added item has been approved.

Sincerely,

Jeffery A. Pierce, P.E.
Senior Project Manager

J.A.P:smr

cc: Tom McHenry - Gibson Dunn & Crutcher
Tom Wideman - Exide Technologies
Fred Ganster - Exide Technologies
Central Files

ATTACHMENT 3

SCOPE OF WORK FOR INTERIM MEASURES IMPLEMENTATION

PURPOSE

Interim measures are actions to control and/or eliminate releases of hazardous waste and/or hazardous constituents from a facility prior to the implementation of a final corrective measure. Interim measures must be used whenever possible to achieve the goal of stabilization which is to control or abate threats to human health and/or the environment, and to prevent or minimize the spread of contaminants while long-term corrective action alternatives are being evaluated.

SCOPE

The documents required for Interim Measures (IM) are, unless the Department of Toxic Substances Control (Department) specifies otherwise, an IM Workplan, an Operation and Maintenance Plan and IM Plans and Specifications. The scope of work (SOW) for each document is specified below. The SOWs are intended to be flexible documents capable of addressing both simple and complex site situations. If the Owner/Operator or Respondent can justify, to the satisfaction of the Department, that a plan or portions thereof are not needed in the given site specific situation, then the Department may waive that requirement.

The Department may require the Owner/Operator or Respondent to conduct additional studies beyond what is discussed in the SOWs in order to support the IM program. The Owner/Operator or Respondent will furnish all personnel, materials and services necessary to conduct the additional tasks.

A. Interim Measures Workplan

The Owner/Operator or Respondent shall prepare an IM Workplan that evaluates interim measure options and clearly describes the proposed interim measure, the key components or elements that are needed, describes the designer's vision of the interim measure in the form of conceptual drawings and schematics, and includes procedures and schedules for implementing the interim measure(s). The IM Workplan must be approved by the Department prior to implementation. The IM Workplan must, at a minimum, include the following elements:

1. Introduction/Purpose

Describe the purpose of the document and provide a summary of the project.

2. Conceptual Model of Contaminant Migration

It is important to know where the contaminants are and to understand how they are moving before an adequate interim measure can be developed. To address this critical question, the Owner/Operator or Respondent must present a conceptual model of the site and contaminant migration. The conceptual model consists of a working hypothesis of how the contaminants may move from the release source to the receptor population. The conceptual model is developed by looking at the applicable physical parameters (e.g., water solubility, density, Henry's Law Constant, etc.) for each contaminant and assessing how the contaminant may migrate given the existing site conditions (geologic features, depth to groundwater, etc.). Describe the phase (water, soil, gas, non-aqueous) and location where contaminants are likely to be found. This analysis may have already been done as part of earlier work (e.g., Current Conditions Report). If this is the case, then provide a summary of the conceptual model with a reference to the earlier document.

3. Evaluation of Interim Measure Alternatives

List, describe and evaluate interim measure alternatives that have the potential to stabilize the facility. Propose interim measures for implementation and provide rationale for the selection. Document the reasons for excluding any interim measure alternatives.

4. Description of Interim Measures

Qualitatively describe what the proposed interim measure is supposed to do and how it will function at the facility.

5. Data Sufficiency

Review existing data needed to support the design effort and establish whether or not there are sufficient accurate data available for this purpose. The Owner/Operator or Respondent must summarize the assessment findings and specify any additional data needed to complete the interim measure design. The Department may require or the Owner/Operator or

Respondent may propose that sampling and analysis plans and/or treatability study workplans be developed to obtain the additional data. Submittal times for any new sampling and analysis plans and/or treatability study workplans must be included in the project schedule.

6. Project Management

Describe the levels of authority and responsibility (include organization chart), lines of communication and a description of the qualifications of key personnel who will direct the interim measure design and implementation effort (including contractor personnel).

7. Project Schedule

The project schedule must specify all significant steps in the process, when any key documents (e.g., plans and specifications, operation and maintenance plan) are to be submitted to the Department and when the interim measure is to be implemented.

8. Design Basis

Discuss the process and methods used to design all major components of the interim measure. Discuss the significant assumptions made and possible sources of error. Provide justification for the assumptions.

9. Conceptual Process/Schematic Diagrams.

10. Site plan showing preliminary plant layout and/or treatment area.

11. Tables listing number and type of major components with approximate dimensions.

12. Tables giving preliminary mass balances.

13. Site safety and security provisions (e.g., fences, fire control, etc.).

14. Waste Management Practices

Describe the wastes generated by the construction of the interim measure and how they will be managed. Also discuss drainage and indicate how rainwater runoff will be managed.

15. Required Permits

List and describe the permits needed to construct the interim measure. Indicate on the project schedule when the permit applications will be submitted to the applicable agencies and an estimate of the permit issuance date.

16. Sampling and monitoring activities may be needed for design and during construction of the interim measure. If sampling activities are necessary, the IM Workplan must include a complete sampling and analysis section which specifies the following information:

a. Description and purpose of monitoring tasks;
b. Data quality objectives;
c. Analytical test methods and detection limits;
d. Name of analytical laboratory;
e. Laboratory quality control (include laboratory QA/QC procedures in appendices)
f. Sample collection procedures and equipment;
g. Field quality control procedures:
    - o duplicates (10% of all field samples)
    - o blanks (field, equipment, etc.)
    - o equipment calibration and maintenance
    - o equipment decontamination
    - o sample containers
    - o sample preservation
    - o sample holding times (must be specified)
    - o sample packaging and shipment
    - o sample documentation (field notebooks, sample labeling, etc);
h. Criteria for data acceptance and rejection; and
i. Schedule of monitoring frequency.

The Owner/Operator or Respondent shall follow all Department and USEPA guidance for sampling and analysis. The Department may request that the sampling and analysis section be a separate document.

17. Appendices including:

Design Data - Tabulations of significant data used in the design effort;

Equations - List and describe the source of major equations used in the design process;

Sample Calculations - Present and explain one example calculation for significant calculations; and

Laboratory or Field Test Results.

B. **Interim Measures Operation and Maintenance Plan**

The Owner/Operator or Respondent shall prepare an Interim Measures Operation and Maintenance (O&M) Plan that includes a strategy and procedures for performing operations, maintenance, and monitoring of the interim measure(s). An Interim Measures Operation and Maintenance Plan shall be submitted to the Department simultaneously with the Plans and Specifications. The O&M plan shall, at a minimum, include the following elements:

1. Purpose/Approach

   Describe the purpose of the document and provide a summary of the project.

2. Project Management

   Describe the levels of authority and responsibility (include organization chart), lines of communication and a description of the qualifications of key personnel who will operate and maintain the interim measure(s) (including contractor personnel).

3. System Description

   Describe the interim measure and identify significant equipment.

4. Personnel Training

   Describe the training process for O&M personnel. The Owner/Operator or Respondent shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, start up and operation of the treatment systems, and training covering appropriate operational procedures once the start-up has been successfully accomplished.

5. Start-Up Procedures

   Describe system start-up procedures including any operational testing.

6. Operation and Maintenance Procedures

   Describe normal operation and maintenance procedures including:

   a. Description of tasks for operation;

b. Description of tasks for maintenance;
c. Description of prescribed treatment or operation condition, and
d. Schedule showing frequency of each O&M task.

7. Replacement schedule for equipment and installed components.

8. Waste Management Practices

Describe the wastes generated by operation of the interim measure and how they will be managed. Also discuss drainage and indicate how rainwater runoff will be managed.

9. Sampling and monitoring activities may be needed for effective operation and maintenance of the interim measure. If sampling activities are necessary, the O&M plan must include a complete sampling and analysis section which specifies the following information:

a. Description and purpose of monitoring tasks;
b. Data quality objectives;
c. Analytical test methods and detection limits;
d. Name of analytical laboratory;
e. Laboratory quality control (include laboratory QA/QC procedures in appendices)
f. Sample collection procedures and equipment;
g. Field quality control procedures:
   - o duplicates (10% of all field samples)
   - o blanks (field, equipment, etc.)
   - o equipment calibration and maintenance
   - o equipment decontamination
   - o sample containers
   - o sample preservation
   - o sample holding times (must be specified)
   - o sample packaging and shipment
   - o sample documentation (field notebooks, sample labeling, etc);

h. Criteria for data acceptance and rejection; and
i. Schedule of monitoring frequency.

The Owner/Operator or Respondent shall follow all Department and USEPA guidance for sampling and analysis. The Department may request that the sampling and analysis section be a separate document.

10. O&M Contingency Procedures:

a. Procedures to address system breakdowns and operational problems including a list of redundant

and emergency back-up equipment and procedures;

b. Should the interim measure suffer complete failure, specify alternate procedures to prevent release or threatened releases of hazardous substances, pollutants or contaminants which may endanger public health and/or the environment or exceed cleanup standards; and

c. The O&M Plan must specify that, in the event of a major breakdown and/or complete failure of the interim measure (includes emergency situations), the Owner/Operator or Respondent will orally notify the Department within 24 hours of the event and will notify the Department in writing within 72 hours of the event. The written notification must, at a minimum, specify what happened, what response action is being taken and/or is planned, and any potential impacts on human health and the environment.

11. Data Management and Documentation Requirements

Describe how analytical data and results will be evaluated, documented and managed, including development of an analytical database. State the criteria that will be used by the project team to review and determine the quality of data.

The O&M Plan shall specify that the Owner/Operator or Respondent collect and maintain the following information:

a. Progress Report Information

- Work Accomplishments (e.g., performance levels achieved, hours of treatment operation, treated and/or excavated volumes, concentration of contaminants in treated and/or excavated volumes, nature and volume of wastes generated, etc.).

- Record of significant activities (e.g., sampling events, inspections, problems encountered, action taken to rectify problems, etc.).

b. Monitoring and laboratory data;
c. Records of operating costs; and
d. Personnel, maintenance and inspection records.

The Department may require that the Owner/Operator or Respondent submit additional reports that evaluate the effectiveness of the interim measure in meeting the stabilization goal.

C. **IM Plans and Specifications**

[Note - The Owner/Operator or Respondent may propose or the Department may require the submittal of other draft plans and specifications at different points in the design process.]

The Owner/Operator or Respondent shall prepare Plans and Specifications for the interim measure that are based on the conceptual design but include additional detail. The Plans and Specifications shall be submitted to the Department simultaneously with the Operation and Maintenance Plan. The design package must include drawings and specifications needed to construct the interim measure. Depending on the nature of the interim measure, many different types of drawings and specifications may be needed. Some of the elements that may be required are:

- General Site Plans
- Process Flow Diagrams
- Mechanical Drawings
- Electrical Drawings
- Structural Drawings
- Piping and Instrumentation Diagrams
- Excavation and Earthwork Drawings
- Equipment Lists
- Site Preparation and Field Work Standards
- Preliminary Specifications for Equipment and Material

General correlation between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications to the Department, the Owner/Operator or Respondent shall:

a. Proofread the specifications for accuracy and consistency with the conceptual design; and

b. Coordinate and cross-check the specifications and drawings.

ATTACHMENT 4

SCOPE OF WORK FOR HEALTH AND SAFETY PLAN

The Department of Toxic Substances Control (Department) may require that the Owner/Operator or Respondent prepare a Health and Safety Plan for any corrective action field activity (e.g., soil or ground water sampling, drilling, construction, operation and maintenance of a treatment system, etc.). The Health and Safety Plan must, at a minimum, include the following elements:

1. Objectives

Describe the goals and objectives of the Health and Safety Plan (must apply to on-site personnel and visitors). The Health and Safety Plan must be consistent with the facility Contingency Plan, OSHA Regulations, NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985), all state and local regulations and other Department guidance as provided.

2. Hazard Assessment

List and describe the potentially hazardous substances that could be encountered by field personnel during field activities.

Discuss the following:

- Inhalation Hazards
- Dermal Exposure
- Ingestion Hazards
- Physical Hazards
- Overall Hazard Rating

Include a table that, at a minimum, lists: Known Contaminants, Highest Observed Concentration, Media, Symptoms/Effects of Acute Exposure.

3. Personal Protection/Monitoring Equipment

For each field task, describe personal protection levels and identify all monitoring equipment.

Describe any action levels and corresponding response actions (i.e., when will levels of safety be upgraded).

Describe decontamination procedures and areas.

4. Site Organization and Emergency Contacts

List and identify all contacts (include phone numbers). Identify the nearest hospital and provide a regional map showing the shortest route from the facility to the hospital. Describe site emergency procedures and any site safety organizations. Include evacuation procedures for neighbors (where applicable).

Include a facility Map showing emergency station locations (first aid, eye wash areas, etc.).

ATTACHMENT 5

Community Profile

The following items should be included in the Community Profile:

SITE DESCRIPTION

- Description of proposed project.
- Map.
- Description of the site/facility location.
- Description of the surrounding land uses and environmental resources (including proximity to residential housing, schools, churches, etc.).
- Visibility of the site to neighbors.
- Demographics of community in which the site is located (e.g., socioeconomic level, ethnic composition, specific language considerations, etc.). This information may be found in local libraries (e.g., census records).

LOCAL INTEREST

- Contacts with community members - any inquiries from community members, groups, organizations, etc. (include names, phone numbers, and addresses on the key contact list).
- Community interactions - any current meetings, events, presentations, etc.
- Media coverage - any newspaper, magazine, television, etc., coverage.
- Government contacts - city and county staff, state and local elected officials.

KEY CONTACT LIST

- Names, addresses, and phone numbers of city manager, city/county planning department staff, local elected officials, and other community members with whom previous contact has been made.

PAST PUBLIC INVOLVEMENT ACTIVITIES

- Any ad hoc committees, community meetings, workshops, letters, newsletters, etc., about the site or similar activity.

KEY ISSUES AND CONCERNS

- Any specific concerns/issues raised by the community regarding the site/facility or any activities performed on the site/facility.
- Any anticipated concerns/issues regarding the site/facility.
- Any general environmental concerns/issues in the community.

PP Review _____ Date _____

ATTACHMENT 6

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION

PURPOSE

The purpose of this RCRA Facility Investigation (RFI) is to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units, and other source areas at the Facility and to gather all necessary data to support the Corrective Measures Study. The RFI must include characterization of the facility (processes, waste management, etc), environmental setting, source areas, nature and extent of contamination, migration pathways (transport mechanisms) and all potential receptors.

SCOPE

The documents required for an RFI are, unless the Department of Toxic Substances Control (Department) specifies otherwise, a Current Conditions Report, a RCRA Facility Investigation Workplan, a RCRA Facility Investigation Report and a Health and Safety Plan. The scope of work (SOW) for each document is specified below. The SOW's are intended to be flexible documents capable of addressing both simple and complex site situations. If the Owner/Operator or Respondent can justify, to the satisfaction of the Department, that a plan and/or report or portions thereof are not needed in the given site specific situation, then the Department may waive that requirement.

The Department may require the Owner/Operator or Respondent to conduct additional studies beyond what is discussed in the SOW's in order to meet the objectives of the RFI. The Owner/Operator or Respondent will furnish all personnel, materials and services necessary to conduct the additional tasks.

A. Current Conditions Report

The Current Conditions Report must describe existing information pertinent to the facility including operations, processes, waste management, geology, hydrogeology, contamination, migration pathways, potential receptor populations and interim corrective measures. The required format for a current conditions report is described below. If some of this information does not exist, so indicate in the applicable section.

1. Introduction

1.1 Purpose

Describe the purpose of the current conditions report (e.g., summary and evaluation of existing information related to the facility; required as a component of the RCRA Facility Investigation).

1.2 Organization of Report

Describe how the report is organized.

2. Facility Description

Summarize background, current operations, waste management and products produced at the facility. Include a map that shows the general geographic location of the facility.

Describe current facility structures including any buildings, tanks, sumps, wells, waste management areas, landfills, ponds, process areas and storage areas.

Include detailed facility maps that clearly show current property lines, the owners of all adjacent property, surrounding land use (residential, commercial, agricultural, recreational, etc.), all tanks, buildings, process areas, utilities, paved areas, easements, rights-of-way, waste management areas, ponds, landfills, piles, underground tanks, wells and other facility features.

3. Facility History

3.1 Ownership History

Describe the ownership history of the facility.

3.2 Operational History

Describe in detail how facility operations, processes and products have changed over time (historical aerial photographs could be useful for this purpose).

3.3 Regulatory History

Describe all permits (including waste discharge requirements) requested or received, any enforcement actions taken by the Department or designated agencies and any closure activities that are planned or underway.

3.4 Waste Generation

Describe all wastes (solid or hazardous) that have been generated at the facility. Include approximate waste volumes generated and summaries of any waste analysis data. Show how the waste stream (volume and chemical composition) has changed over time.

3.5 Waste Management

Describe in detail all past solid and hazardous waste treatment, storage and disposal activities at the facility. Show how these activities have changed over time and indicate the current status. Make a clear distinction between active waste management units and older out of service waste management units. Identify which waste management units are regulated under RCRA or California Health and Safety Code.

Include maps showing: (1) all solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980, (2) all known past solid waste or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980 and (3) all known past or present underground tanks or piping.

3.6 Spill and Discharge History

Provide approximate dates or periods of past product and waste spills, identify the materials spilled and describe any response actions conducted. Include a summary of any sampling data generated as a result of the spill. Include a map showing approximate locations of spill areas at the facility.

3.7 Chronology of Critical Events

Provide a chronological list (including a brief description) of major events, communications, agreements, notices of violation, spills, discharges that occurred throughout the facility's history.

4. Environmental Setting

4.1 Location/Land Use

Discuss facility size, location and adjacent land use. Include a rough demographic profile of the human population who use or have access to the facility and

adjacent lands. Provide approximate distance to nearest residential areas, schools, nursing homes, hospitals, parks, playgrounds, etc.

4.2 Local Ecology

Describe any endangered or threatened species near the facility. Include a description of the ecological setting on and adjacent to the facility. Provide approximate distance to nearest environmentally sensitive areas such as marsh lands, wetlands, streams, oceans, forests, etc.

4.3 Topography and Surface Drainage

Describe the regional and site specific topography and surface drainage patterns that exist at the facility. Include a map that shows the topography and surface drainage depicting all waterways, wetlands, floodplains, water features, drainage patterns and surface water containment areas.

4.4 Climate

Discuss mean annual temperatures, temperature extremes, 24-hour rainfall, average annual rainfall, prevailing wind direction, etc.

4.5 Surface Water Hydrology

Describe the facility's proximity (distance) to surface water bodies (e.g., coastal waters, lakes, rivers, creeks, drainage basins, floodplains, vernal pools, wetlands, etc.).

4.6 Geology

Describe the regional and site specific geology including stratigraphy and structure. Include cross sections to show the subsurface stratigraphy.

4.7 Hydrogeology

Describe the regional and site specific hydrogeologic setting including any information concerning local aquifers, ground water levels, gradients, flow direction, hydraulic conductivity, and velocity. Include potentiometric surface contour maps. Describe the beneficial uses of the ground water (e.g., drinking water supply, agricultural water supply, etc.).

4.8 Ground Water Monitoring System

Describe the facility's ground water monitoring system including a table detailing the existing well construction. The table must, at a minimum, identify the following construction details for each well:

Well ID
Completion Date
Drilling Method
Borehole Diameter (inches)
Well Casing Diameter and Type
Measuring Point Elevation (feet MSL)
Borehole Depth (feet BGS)
Depth of Well (feet)
Screened Interval
Formation Screened
Slot Size & Type (inches)
Filter Pack Material
Filter Pack Thickness
Type of Filter Pack Seal
Thickness of Filter Pack Seal
Pump System (dedicated or non-dedicated)
Type of Pump
Approximate Depth to Water (feet BGS)

If some of this information is not available, so indicate on the table with an "NA". {BGS: Below Ground Surface, MSL: Mean Sea Level}

The monitoring well locations must be shown on the facility map (see Section A.2 of this Attachment).

5. Existing Degree and Extent of Contamination

For each medium where the Permit or Order identifies a release (e.g., soil, ground water, surface water, air, etc.), describe the existing extent of contamination. This description must include all available monitoring data and qualitative information on the locations and levels of contamination at the facility (both onsite and offsite). Include a general assessment of the data quality, a map showing the location of all existing sampling points and potential source areas and contour maps showing any existing ground water plumes at the facility (if ground water release). Highlight potential ongoing release areas that would warrant use of interim corrective measures (see Section 8, Interim Corrective Measures).

5.1 Previous Investigations

List and briefly describe all previous investigations that have occurred at the facility, agencies (e.g., the Department's Site Mitigation Branch, the Regional Water Quality Control Board, etc.) which required and/or oversaw the investigations, and agency contacts.

6. Potential Migration Pathways

6.1 Physical Properties of Contaminants

Identify the applicable physical properties for each contaminant that may influence how the contaminant moves in the environment. These properties could include melting point (degrees C), water solubility (mg/l), vapor pressure (mm Hg), Henry's law constant (atm-m3/mol), density (g/cc), dynamic viscosity (cp), kinematic viscosity (cs), octanol/water partition coefficient (log Kow), soil organic carbon/water partition coefficient (log koc) and soil/water partition coefficients. Include a table that summarizes the applicable physical properties for each contaminant.

6.2 Conceptual Model of Contaminant Migration

Develop a conceptual model of contaminant migration. The conceptual model consists of a working hypothesis of how the contaminants may move from the release source to the receptor population. The conceptual model is developed by looking at the applicable physical parameters for each contaminant and assessing how the contaminant may migrate given the existing site conditions (geologic features, depth to ground water, etc.).

Describe the phase (water, soil, gas, non-aqueous) and location where contaminants are likely to be found (e.g., if a ground water contaminant has a low water solubility and a high density, then the contaminant will likely sink and be found at the bottom of the aquifer, phase: non-aqueous). Include a discussion of potential transformation reactions that could impact the type and number of contaminants (i.e., what additional contaminants could expected as a result of biotic and abiotic transformation reactions given the existing soil conditions).

A typical conceptual model should include a discussion similar to the following: benzene, ethylbenzene,

toluene and xylenes are potential contaminants at the facility. Based on their high vapor pressures and relatively low water solubilities (see Henry's law constant), the primary fate of these compounds in surface soils or surface water is expected to be volatilization to the atmosphere. These mono-cyclic aromatic hydrocarbons may leach from soils into groundwater. The log koc (soil organic carbon/water partition coefficient) values for these compounds ranges from 1.9 to 4.0, indicating that sorption to original matter in soils or sediments may occur only to a limited extent.

7. Potential Impacts of Existing Contamination

Describe the potential impacts on human health and the environment from any existing contamination and/or ongoing activities at the facility. This description must consider the possible impacts on sensitive ecosystems and endangered species as well as on local populations. Potential impacts from any releases to ground water, surface water, soil (including direct contact with contaminated surface soil) and air (including evaporation of volatile organic compounds from contaminated soil) must be discussed.

7.1 Ground Water Releases

Identify all wells (municipal, domestic, agricultural, industrial, etc.) within a 1 mile radius of the facility. Include a summary of available water sampling data for any identified municipal, industrial or domestic supply wells.

Develop a well inventory table that lists the following items for each identified well:

Well Designation
State ID
Reported Owner
Driller
Date of Completion
Original Use of Well
Current Use of Well
Drilling Method
Borehole Diameter (inches)
Casing Diameter (inches)
Perforated Interval (feet)
Gravel Pack Interval (feet)
Total Well Depth (feet)
Depth to Water (feet below ground surface)
Date of Water Level Measurement

If some of this information is not available, so indicate on the table with an "NA".

Include a regional map showing the facility, ground water flow direction (if known) and the location of all identified wells within a 1 mile radius of the facility.

Identify and describe any potential ground water discharge to surface water bodies.

Identify and list all relevant and applicable water standards for the protection of human health and the environment (e.g., maximum contaminant levels, water quality standards, etc).

7.2 Surface Water Releases

Discuss the facility's potential impact on surface water within a 2 mile radius of the facility. Describe the potential beneficial uses of the surface water (e.g., drinking water supply, recreational, agricultural, industrial, or environmentally sensitive). Identify all water supply intake points and contact areas within a 2 mile radius of the facility. Include a summary of the most recent water sampling data available for each of the identified water supply intake points. Include a description of the biota in surface water bodies on, adjacent to, or which can be potentially affected by the release. Also summarize any available sediment sampling data.

Include a regional map showing the facility, surface water flow direction, beneficial use areas, and the location of any identified water supply intake points or contact areas that are within a 2 mile radius of the facility.

7.3 Sensitive Ecosystems/Habitats

Discuss the facility's potential impact on sensitive ecosystems.

8. Interim Corrective Measures and Stabilization Assessment

Identify all corrective measures that were or are being undertaken at the facility to stabilize contaminant releases. Describe the objectives of the corrective measures including how the measure is mitigating a potential threat to human health and the environment. Summarize the design features of the corrective measure. Include a

schedule for completing any ongoing or future work.

Identify and describe potential interim corrective measure alternatives that could be implemented immediately to stabilize any ongoing releases and/or prevent further migration of contaminants.

9. **Data Needs**

Assess the amount and quality of existing data concerning the facility and determine what additional information must be collected to meet the objectives of the RFI. This assessment must identify any additional information that may be needed to (1) support development of interim measures for early action and (2) adequately evaluate and compare corrective measures alternatives (e.g., field work, treatability studies, computer modeling, literature searches, vendor contacts, etc.). For example, if soil vapor extraction (SVE) is a likely option to address contamination at the facility, then the RFI should collect applicable field data to assess SVE (e.g., soil gas analysis, depth to ground water, etc.). The RFI Workplan must detail how this additional information will be collected.

10. **References**

Provide a list of references cited in the Current Condition Report.

B. RCRA Facility Investigation Workplan

The RCRA Facility Investigation (RFI) Workplan shall define the procedures necessary to:

- Characterize the presence, magnitude, extent (horizontal and vertical), rate of movement and direction of any ground water contamination in and around the facility (only required for releases to ground water);
- Characterize the geology and hydrogeology in and around the facility (only required for releases to ground water and possibly for releases to soil);
- Characterize the presence, magnitude, extent (horizontal and vertical), rate of movement and direction of any soil contamination in and around the facility (only required for releases to soil);
- Characterize the presence, magnitude, extent (horizontal and vertical), rate of movement and direction of any soil gas contamination in and around the facility (may be required for releases to ground water and/or soil depending on the circumstances);
- Characterize the presence, magnitude, extent (horizontal and vertical), rate of movement and direction of any surface water contamination (includes surface water sediments) at the facility (only required for releases to surface water);
- Characterize the presence, magnitude, extent (horizontal and vertical), rate of movement and direction of any air releases at the facility (only required for air releases);
- Characterize any potential sources of contamination (required for all releases);
- Characterize the potential pathways of contaminant migration (required for all releases);
- Identify any actual or potential receptors (required for all releases);
- Gather all data to support a risk and/or ecological assessment (if required);
- Gather all necessary data to support interim corrective measures to stabilize ongoing releases and prevent

further contaminant migration (required for all releases); and

- Gather all necessary data to support the Corrective Measures Study (required for all releases). This could include conducting pilot, laboratory and/or bench scale studies to assess the effectiveness of a treatment method.

The RFI Workplan shall describe all aspects of the investigation, including project management, sampling and analysis, well drilling and installation and quality assurance and quality control. If the scope of the investigation is such that more than one phase is necessary, the "Phase 1" RFI Workplan must include a summary description of each phase.

The required format for an RFI Workplan is described below:

1. Introduction

Briefly introduce the Workplan. Discuss the Order or Permit requiring the RFI and how the Workplan is organized.

2. Investigation Objectives

2.1 Project Objectives

Describe the overall objectives and critical elements of the RFI. State the general information needed from the site (e.g., soil chemistry, hydraulic conductivity of aquifer, stratigraphy, ground water flow direction, identification of potential receptors, etc.). The general information should be consistent with the objectives of the RFI and the data needs identified in the Current Conditions Report.

2.2 Data Quality Objectives

Provide data quality objectives that identify what data are needed and the intended use of the data.

3. Project Management

Describe how the investigation will be managed, including the following information:

- Organization chart showing key personnel, levels of authority and lines of communication;

- o Project Schedule; and
- o Estimated Project Budget.

Identify the individuals or positions who are responsible for: project management, field activities, laboratory analysis, database management, overall quality assurance, data validation, etc. Include a description of qualifications for personnel performing or directing the RFI, including contractor personnel.

4. Facility Background

Summarize existing contamination (e.g., contaminants, concentrations, etc.), local hydrogeologic setting and any other areas of concern at the facility. Include a map showing the general geographic location of the facility and a more detailed facility map showing the areas of contamination. Provide a reference to the Current Conditions Report and/or other applicable documents as a source of additional information.

5. Field Investigation

5.1 Task Description

Provide a qualitative description of each investigation task. Example tasks may include, but are not limited to the following:

Task 1: Surface Soil Sampling
Task 2: Subsurface Soil Boring
Task 3: Data Gathering to Support Interim Corrective Measures
Task 4: Monitoring Well Installation
Task 5: Aquifer Testing
Task 6: Ground Water Sampling
Task 7: Potential Receptor Identification
Task 8: Treatability Studies

5.2 Rationale for Sampling

Describe where all samples will be collected (location and depth), types of matrices that will be sampled and the analytical parameters. Explain the rationale for each sampling point, the total number of sampling points, and any statistical approach used to select these points. The conceptual model of contaminant migration developed in the Current Conditions Report should be considered when selecting sampling locations

and depths. If some possible sampling points are excluded, explain why. Describe any field screening techniques that will be used to identify samples for laboratory analysis. Include the rationale for use of field screening techniques and criteria for sample selection.

5.2.1 Background Samples

Background samples should be analyzed for the complete set of parameters for each matrix; treat sediments, surface soils and subsurface soils as separate matrices. Background samples are collected, numbered, packaged, and sealed in the same manner as other samples. For long term and/or especially large projects, it is recommended that 10% of samples collected be from background locations.

5.3 Sample Analysis

List and discuss all analysis proposed for the project. Include a table that summarizes the following information for each analysis to be performed:

- Analytical Parameters
- Analytical Method Reference Number (from EPA SW 846)
- Sample Preparation and/or Extraction Method Reference Number (from SW 846)
- Practical Quantitation Limits

Discuss the rationale for selection of the analytical parameters. The rationale must relate to site history and the RFI objectives. The achievable detection limits or quantitation limits stated in the selected methods must be adequate for valid comparisons of analytical results against any action levels or standards. For example, the objective may be to collect ground water data for comparison with Maximum Contaminant Levels (MCL's). If this were the case, it would be important to ensure that any ground water test methods had detection limits below the MCL's. Give an explanation if all samples from the same matrix will not be analyzed for the same parameters.

Provide the name(s) of the laboratory(s) that will be doing the analytical work. Indicate any special certifications or ratings of the laboratory. Describe the steps that will be taken to select and pre-qualify analytical laboratories to be used including any

previous audits and/or other criteria. If a definite laboratory has not yet been selected, list at least 3 laboratories that are being considered for the analytical work.

5.4 Sample Collection Procedures

Describe how sampling points will be selected in the field, and how these locations will be documented and marked for future reference. If a sampling grid will be used, describe the dimensions and lay out planned for the grid.

Outline sequentially or step-by-step the procedure for collecting a sample for each matrix and each different sampling technique. Include a description of sampling equipment (including materials of construction), field measurements, sample preservation, housekeeping/ cleanliness techniques and well purging procedures. The procedure described must ensure that a representative sample is collected, and that sample handling does not result in cross contamination or unnecessary loss of contaminants. Special care in sample handling for volatile organic samples must be addressed.

Describe how and when duplicates, blanks, laboratory quality control samples and background samples will be collected.

The Owner/Operator or Respondent must include sufficient maps and tables to fully describe the sampling effort. This shall include, at a minimum, a map showing all proposed sampling locations and tables that contain the following information:

Sample Collection Table

Sampling Location/Interval
Analytical Parameters (e.g., volatile organic compounds)
Analytical Method Number
Matrix
Preservation Method
Holding Times
Containers (quantity, size, type plus footnotes that discuss source and grade of containers)

Sample Summary Table

Sample Description/Area (include QC samples)
Analytical Parameters

Analytical Method Number
Preparation or Extraction Method Number
Matrix
Number of Sample Sites
Number of Analyses

5.4.1 Equipment Decontamination

Describe the decontamination procedure for all drilling and sampling equipment (including metal sleeves).

The following is a recommended generic procedure for decontamination of sampling equipment:

- Wash with non-phosphate detergent
- Tap water rinse
- 0.1M nitric acid rinse (when cross contamination from metals is a concern)
- Deionized/distilled water rinse
- Pesticide grade solvent rinse (when semivolatiles and non-volatile organic contamination may be present)
- Deionized/distilled water rinse (twice)
- Organic free water rinse (HPLC grade)

The above procedure is not appropriate for every field condition. Clearly document the decontamination procedures.

5.4.2 Equipment Calibration and Maintenance

Logbooks or pre-formatted calibration worksheets should be maintained for major field instruments, to document servicing, maintenance and instrument modification. The calibration, maintenance and operating procedures for all instruments, equipment and sampling tools must be based upon manufacturer's instructions. List all field equipment to be used, specify the maintenance/calibration frequency for each instrument and the calibration procedures (referenced in text and included in appendices).

5.4.3 Sample Packaging and Shipment

Describe how samples will be packaged and shipped. All applicable Department of Transportation regulations must be followed.

5.4.4 Sample Documentation

Discuss the use of all paperwork including field notebooks, record logs, photographs, sample paperwork, and Chain of Custody forms (include a blank copy in RFI Workplan Appendices) and seals.

Describe how sample containers will be labeled and provide an example label if available. At a minimum, each sample container label should include: project ID, sample location, analytical parameters, date sampled and any preservative added to the sample.

A bound field log book must be maintained by the sampling team to provide a daily record of events.

Field log books shall provide the means of recording all data regarding sample collection. All documentation in field books must be made in permanent ink. If an error is made, corrections must be made by crossing a line through the error and entering the correct information. Changes must be initialed, no entries shall be obliterated or rendered unreadable. Entries in the log book must include, at a minimum, the following for each day's sampling:

Date
Starting Time
Meteorological Conditions
Field Personnel Present
Level of Personal Protection
Site Identification
Field Observations/Parameters
Sample Identification Numbers
Location and Description of Sampling Points
Number of Samples Collected
Time of Sample Collection
Signature of Person Making the Entry

5.4.5 Disposal of Contaminated Materials

Describe the storage and disposal methods for all contaminated cuttings, well development and purge water, disposable equipment, decontamination water, and any other contaminated materials. The waste material must be disposed of in a manner consistent with local, state and federal regulations.

5.4.6 Standard Operating Procedures

If Standard Operating Procedures (SOPs) are referenced, the relevant procedure must be summarized in the RFI Workplan. The SOP must be specific to the type of tasks proposed and be clearly referenced in the RFI Workplan. The SOP must also be directly applicable, as written, to the RFI Workplan; otherwise, modifications to the SOP must be discussed. Include the full SOP description in the RFI Workplan appendix.

5.5 Well Construction and Aquifer Testing

When new monitoring wells (or piezometers) are proposed, describe the drilling method, well design and construction details (e.g., depth of well, screen length, slot size, filter pack material, etc.) and well development procedures. Describe the rationale for proposed well locations and selection of all well design and construction criteria (i.e., provide rationale for selection of slot size and screen length - FYI, USEPA recommends 10 foot screen lengths).

When aquifer testing is proposed, describe the testing procedures, flow rates, which wells are involved, test periods, how water levels will be measured, and any other pertinent information.

6. Quality Assurance and Quality Control

Quality control checks of field and laboratory sampling and analysis serve two purposes: to document the data quality, and to identify areas of weakness within the measurement process which need correction.

Include a summary table of data quality assurance objectives that, at a minimum, lists:

- Analysis Group (e.g., volatile organic compounds)
- Matrix
- Practical Quantitation Limits (PQL)
- Spike Recovery Control Limits (%R)
- Duplicate Control Limits +/-(RPD)
- QA Sample Frequency

A reference may note the specific pages from USEPA's SW 846 Guidance Document that list the test method objectives for precision and accuracy. If the field and laboratory numerical data quality objectives for precision are the same and presented on a single table, then a statement should be

made to this effect and added as a footnote to the table (e.g., "These limits apply to both field and laboratory duplicates"). Include a copy of the analytical laboratory quality assurance/quality control plan in the appendices of the RFI Workplan and provide the equations for calculating precision and accuracy.

6.1 Field Quality Control Samples

6.1.1 Field Duplicates

Duplicates are additional samples that must be collected to check for sampling and analytical precision. Duplicate samples for all parameters and matrices must be collected at a frequency of at least one sample per week or 10 percent of all field samples, whichever is greater.

Duplicates should be collected from points which are known or suspected to be contaminated. For large projects, duplicates should be spread out over the entire site and collected at regular intervals.

Duplicates must be collected, numbered, packaged, and sealed in the same manner as other samples; duplicate samples are assigned separate sample numbers and submitted blind to the laboratory.

6.1.2 Blank Samples

Blanks are samples that must be collected to check for possible cross-contamination during sample collection and shipment and in the laboratory. Blank samples should be analyzed for all parameters being evaluated. At least one blank sample per day must be done for all water and air sampling. Additionally, field blanks are required for soil sampling if non-dedicated field equipment is being used for sample collection.

Blank samples must be prepared using analytically-certified organic-free (HPLC-grade) water for organic parameters and metal-free (deionized-distilled) water for inorganic parameters. Blanks must be collected, numbered, packaged, and sealed in the same manner as other samples; blank samples are assigned separate sample numbers and submitted blind to the laboratory. The following types of blank samples may be required:

Equipment Blank: An equipment blank must be

collected when sampling equipment (e.g., bladder pump) or a sample collection vessel (e.g., a bailer or beaker) is decontaminated and reused in the field. Use the appropriate "blank" water to rinse the sampling equipment after the equipment has been decontaminated and then collect this water in the proper sample containers.

Field Bottle Blank: This type of blank must be collected when sampling equipment decontamination is not necessary. The field bottle blank is obtained by pouring the appropriate "blank" water into a container at a sampling point.

6.2 Laboratory Quality Control Samples

Laboratories routinely perform matrix spike and laboratory duplicate analysis on field samples as a quality control check. A minimum of one field sample per week or 1 per 20 samples (including field blanks and duplicates), whichever is greater, must be designated as the "Lab QC Sample" for the matrix and laboratory duplicate analysis.

Laboratory quality control samples should be selected from sampling points which are suspected to be moderately contaminated. Label the bottles and all copies of the paperwork as "Lab QC Sample"; the laboratory must know that this sample is for their QC analyses. The first laboratory QC sample of the sampling effort should be part of the first or second day's shipment. Subsequent laboratory QC samples should be spread out over the entire sampling effort.

For water matrices, 2-3 times the normal sample volume must be collected for the laboratory QC sample. Additional volume is usually not necessary for soil samples.

6.3 Performance System Audits by the Owner/Operator or Respondent

This section should describe any internal performance and/or system audit which the Owner/Operator or Respondent will conduct to monitor the capability and performance of the project. The extent of the audit program should reflect the data quality needs and intended data uses. Audits are used to quickly identify and correct problems thus preventing and/or reducing costly errors. For example, a performance audit could include monitoring field activities to ensure consistency with the workplan. If the audit

strategy has already been addressed in a QA program plan or standard operating procedure, cite the appropriate section which contains the information.

7. **Data Management**

Describe how investigation data and results will be evaluated, documented and managed, including development of an analytical database. State the criteria that will be used by the project team to review and determine the quality of data. To document any quality assurance anomalies, the RFI QC Summary Forms (see Appendix A of this attachment) must be completed by the analytical laboratory and submitted as part of the RFI Report. In addition, provide examples of any other forms or checklists to be used.

Identify and discuss personnel and data management responsibilities, all field, laboratory and other data to be recorded and maintained, and any statistical methods that may be used to manipulate the data.

8. **References**

Provide a list of references cited in the RFI Workplan.

C. RCRA Facility Investigation Report

An RFI Report must be prepared that describes the entire site investigation and presents the basic results. The RFI Report must clearly present an evaluation of investigation results (e.g., all potential contaminant source areas must be identified, potential migration pathways must be described, and affected media shown, etc.).

The RFI Report must also include an evaluation of the completeness of the investigation and indicate if additional work is needed. This work could include additional investigation activities and/or interim corrective measures to stabilize contaminant release areas and limit contaminant migration. If additional work is needed, the Owner/Operator or Respondent must submit a Phase 2 RFI Workplan and/or Interim Corrective Measures Workplan must be submitted to the Department along with the RFI Report.

At a minimum, the RFI Report must include:

- A summary of investigation results (include tables that summarize analytical results).
- A complete description of the investigation, including all data necessary to understand the project in its entirety including all investigative methods and procedures.
- A discussion of key decision points encountered and resolved during the course of the investigation.
- Graphical displays such a isopleths, potentiometric surface maps, cross-sections, plume contour maps (showing concentration levels, isoconcentration contours), facility maps (showing sample locations, etc.) and regional maps (showing receptor areas, water supply wells, etc.) that describe report results. Highlight important facts such as geologic features that may affect contaminant transport.
- Tables that list all chemistry data for each matrix investigated.
- An analysis of current and existing ground water data to illustrate temporal changes for both water chemistry and piezometric data (use graphics whenever possible).
- A description of potential or known impacts on human and environmental receptors from releases at the facility. Depending on the site specific

circumstances, this analysis could be based on the results from contaminant dispersion models.

- A discussion of any upset conditions that occurred during any sampling events or laboratory analysis that may influence the results. The discussion must include any problems with the chain of custody procedures, sample holding times, sample preservation, handling and transport procedures, field equipment calibration and handling, field blank results that show potential sample contamination and any field duplicate results that indicate a potential problem. Summary tables must be provided that show the upset condition and the samples that could be impacted. The RFI QC Summary Forms (see Appendix A of this attachment) must be completed by the analytical laboratory and submitted as part of the RFI Report.

- Assessment of the entire QA/QC program effectiveness.

In addition to the RFI Report, the Department may require the Owner/Operator or Respondent to submit the analytical results (database) on a floppy disk (Department will specify the format). All raw laboratory and field data (e.g., analytical reports) must be kept at the facility and be made available or sent to the Department upon request.

APPENDIX A

RCRA INVESTIGATION QC SUMMARY FORMS

REGION 9 RCRA FACILITY INVESTIGATION LABORATORY QC SUMMARY
PART 1: SUMMARY OF QC LIMITS

Inorganic Analyses
Method:

LABORATORY:
COMPLETED BY:
ORGANIZATION:
DATE:

SITE/PROJECT:
NUMBER OF SAMPLES:
TYPE OF SAMPLES:
BATCH NUMBER:

QC SUMMARY ELEMENT	LABORATORY CONTROL LIMITS	FREQUENCY PERFORMED
LABORATORY BLANKS		
SAMPLE DUPLICATE %RPD		
LABORATORY CONTROL SAMPLE RECOVERY		
STANDARD ADDITION RESULTS*		
ICP SERIAL DILUTION %D		
SPIKED SAMPLE RECOVERY		
INITIAL CALIBRATION VERIFICATION %D		
CONTINUING CALIBRATION VERIFICATION %D		
INTERFERENCE CHECK SAMPLE RECOVERY		

* expressed as the correlation coefficient

Describe any method modifications or specific problem areas:

1. Does the laboratory have access to the project QAPjP? YES/NO

2. Are the Laboratory Control Limits listed above the same as the limits in the QAPjP? YES/NO

3. Were there QC results outside the stated Control Limits or Frequency listed above? YES/NO

4. If yes to 3, report, in PART 2, all QC results which are outside the stated QC limits or frequency.

5. Was a Case Narrative, describing any difficulties and deviations submitted? YES/NO

All information reported on this form are certified true and correct.

Name: _____

Title: _____

Date: _____

ATTACHMENT 7

SCOPE OF WORK FOR A CORRECTIVE MEASURES STUDY

PURPOSE

The purpose of the Corrective Measures Study (CMS) is to:

1. Develop and evaluate corrective measure alternatives (or a single corrective measure) that may be taken at the Facility to address releases of hazardous wastes (including hazardous constituents); and

2. Recommend the corrective measures to be taken at the Facility that are protective of human health and the environment.

SCOPE

A Corrective Measures Study Workplan and Corrective Measures Study Report are, unless otherwise specified by the Department of Toxic Substances Control (Department), required elements of the CMS. The Scope of Work (SOW) for the Corrective Measures Study Workplan and Report describe what should be included in each document. The SOW's are intended to be flexible documents capable of addressing both simple and complex site situations. If the Owner/Operator or Respondent can justify, to the satisfaction of the Department, that sections of a plan and/or report are not needed in the given site specific situation, then the Department may waive that requirement.

The Department may require the Owner/Operator or Respondent to conduct additional studies beyond what is discussed in the SOW's in order to support the CMS. The Owner/Operator or Respondent will furnish all personnel, materials and services necessary to conduct the additional tasks. The SOW for the Corrective Measures Study Workplan and Report are specified below:

A. **Corrective Measures Study Workplan**

The Corrective Measures Study (CMS) Workplan shall, at a minimum, include the following elements:

1. A description of the overall purpose of the Corrective Measure Study;

2. Corrective measure objectives including proposed media cleanup standards (promulgated federal and state

standards, risk derived standards) and points of compliance;

3. A description of the specific corrective measure technologies and/or corrective measure alternatives which will be studied;

4. A description of the general approach to investigating and evaluating potential corrective measures;

5. A summary description of any proposed pilot, laboratory and/or bench scale studies. Proposed studies must be further detailed in either the CMS Workplan or in separate workplans. Submittal times for separate workplans must be included in the CMS Workplan project schedule;

6. A proposed outline for the CMS Report including a description of how information will be presented;

7. A description of overall project management including overall approach, levels of authority (include organization chart), lines of communication, budget and personnel. Include a description of qualifications for personnel directing or performing the work; and

8. A project schedule that specifies all significant steps in the process and when key documents (e.g., CMS Report) are to be submitted to the Department.

B. Corrective Measures Study Report

The Corrective Measures Study (CMS) Report shall, at a minimum, include the following elements:

1. Introduction/Purpose

Describe the purpose and intent of the document.

2. Description of Current Conditions

The Owner/Operator or Respondent shall include a brief discussion of any new information that has been developed since the RCRA Facility Investigation Report was finalized. This discussion should concentrate on those issues which could significantly affect the evaluation and selection of the corrective measure alternative(s).

3. Corrective Action Objectives

The Owner/Operator or Respondent shall propose corrective action objectives including applicable media cleanup standards. The corrective action objectives must be based on available promulgated federal and state cleanup standards, risk derived standards, data and information gathered during the corrective action process (e.g., from interim measures, RCRA Facility Investigation, etc.), and/or other applicable guidance documents. If no specific standards exist for a given contaminant and media, the Owner/Operator or Respondent shall propose and justify a media cleanup standard. The Department may require that the Owner/Operator or Respondent conduct a risk assessment to develop appropriate cleanup standards.

4. Identification and Screening of Corrective Measure Technologies

a. <u>Identification</u>

List and briefly describe potentially applicable technologies for each affected media that may be used to achieve the corrective action objectives. The Owner/Operator or Respondent should consider including a table that summarizes the available technologies.

The Owner/Operator or Respondent should consider innovative treatment technologies, especially in situations where there are a limited number of applicable corrective measure technologies. Innovative technologies are defined as those technologies for source control other than incineration,

solidification/stabilization and pumping with conventional treatment for contaminated groundwater. Innovative treatment technologies may require extra initial effort to gather information, analyze options and to adapt the technology to site specific situations. However, in the long run, innovative treatment technologies could be more cost effective. Pilot, laboratory and/or bench scale studies are useful for evaluating innovative treatment technologies. Depending on the site-specific situation, the Department may require the Owner/Operator or Respondent to consider additional technologies.

b. Screening

Technologies must be screened to eliminate those that may prove unfeasible to implement given the existing set of waste and site-specific conditions. The screening is accomplished by evaluating technology limitations (e.g., for volume, area, contaminant concentrations, interferences, etc.) and using contaminant and site characterization information from the RCRA Facility Investigation to screen out technologies that cannot be fully implemented at the facility. The screening process must focus on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions (e.g., depth to groundwater and aquitards).

As with all decisions during the CMS, the screening of technologies must be fully documented. This is especially true if the screening step indicates that only one corrective action technology should proceed to the next step and be evaluated in detail. List the corrective action technologies selected for further evaluation. Also document the reasons for excluding any corrective action technologies. The Owner/Operator or Respondent should consider including a table that summarizes the findings.

5. **Corrective Measure Alternative Development**

Assemble the technologies that pass the screening step into specific alternatives that have potential to meet the corrective action objectives. Options for addressing less complex sites could be relatively straightforward and may only require evaluation of a single or limited number of alternatives.

Each alternative may consist of an individual technology or a combination of technologies used in sequence (e.g., treatment train). Depending on the site specific situation,

different alternatives may be considered for separate areas of the facility. List and briefly describe each corrective measure alternative.

6. Evaluation of Corrective Measure Alternatives

Each corrective measure alternative must be evaluated (including its components) based on Short- and Long-Term Effectiveness, Reduction of Toxicity, Mobility and/or Volume, Long Term Reliability, Implementability, and Preliminary Cost.

a. Short-and Long-Term Effectiveness

Each corrective measure alternative must be evaluated for effectiveness in protecting human health and the environment and meeting the corrective action objectives. Both short- and long-term components of effectiveness must be evaluated; short-term referring to the construction and implementation period, and long-term referring to the period after the remedial action is complete. Estimate approximately how much time it will take to implement each corrective measure alternative, how much time to see initial beneficial results, and how much time to achieve the corrective action objectives.

The evaluation of short-term effectiveness must include possible threats to the safety of nearby communities, workers, and environmentally sensitive areas (e.g., oceans, wetlands) during construction of the corrective measure alternative. Factors to consider are fire, explosion, exposure to hazardous substances and potential threats associated with treatment, excavation, transportation and re-disposal or containment of waste material. Laboratory and/or field studies are extremely useful in estimating the effectiveness of corrective measures and should be used whenever possible.

The evaluation of long-term effectiveness must include possible threats to the safety of nearby communities, workers, and environmentally sensitive areas (e.g., oceans, wetlands) during operation of the corrective measure alternative.

b. Reduction of Toxicity, Mobility and/or Volume

Each corrective measure alternative must be evaluated for its ability to reduce the toxicity, mobility, and/or volume of the contaminated media. Reduction in toxicity, mobility, and/or volume refers to changes in

one or more characteristics of the contaminated media by the use of corrective measures that decrease the inherent threats associated with the media.

Estimate how much the corrective measure alternative will reduce the waste toxicity, volume and/or mobility (compare initial site conditions to post-corrective measure conditions). In general, corrective measures that have a high degree of permanence and reduce the contaminant toxicity, mobility and volume through treatment.

c. Long-Term Reliability

Each corrective measure alternative must be evaluated as to its long-term reliability. This evaluation includes consideration of operation and maintenance requirements.

Demonstrated and expected reliability is a way of assessing the risk and effect of failure. Discuss whether the technology or combination of technologies have been used effectively together under analogous site conditions, whether failure of any one technology in the alternative has an impact on receptors or contaminant migration, and whether the alternative would have the flexibility to deal with uncontrollable changes at the site (e.g., heavy rain storms, earthquakes, etc).

Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements must also be considered.

Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure alternative shall be evaluated in terms of the projected useful life of the overall alternative and of its component technologies. Useful life is defined as the length of time the necessary or required level of effectiveness can be maintained.

d. Implementability of Corrective Measure Alternatives

The implementability criterion addresses the technical and administrative feasibility of implementing a corrective measure alternative and the availability of various services and materials needed during implementation. Each corrective measure alternative must be evaluated using the following criteria:

Construction and Operation: Corrective measure alternatives must be feasible to implement given the existing set of waste and site-specific conditions. This evaluation was initially done for specific technologies during the screening process and is addressed again in this detailed analysis of the alternative as a whole. It is not intended that the screening process be repeated here, but instead to highlight key differences and/or changes from the screening analysis that may result from combining technologies.

Administrative Feasibility: Discuss the administrative activities needed to implement the corrective measure alternative (e.g., permits, public acceptance, rights of way, off-site approvals, etc.).

Availability of Services and Materials: Discuss the availability of adequate off-site treatment, storage capacity, disposal services, needed technical services and materials, and the availability of prospective technologies for each corrective measure alternative.

e. Preliminary Cost Estimates

Develop a preliminary cost estimate for each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs. Include a description of how the costs were estimated and what assumptions were used.

- The preliminary capital cost estimate must consider all key costs including, at a minimum, costs for engineering, mobilization, demobilization, site preparation, construction, materials, labor, equipment purchase and rental, sampling, analysis, waste disposal, permitting and health and safety measures.

- The preliminary operation and maintenance cost estimate must consider all key costs including, at a minimum, costs for labor, training, sampling,

analysis, maintenance materials, utilities, waste disposal, waste treatment, permitting and health and safety measures.

- o Calculate the net present value of preliminary capital and operation and maintenance costs for each corrective measure alternative.

7. **Recommendation and Justification of the Corrective Measure Alternative**

The Owner/Operator or Respondent shall recommend and justify a corrective measure alternative using the five criteria specified in Section 6. This recommendation shall include summary tables which allow the alternative or alternatives to be easily understood. Tradeoffs among implementability, effectiveness, reliability, and other pertinent factors shall be highlighted.

In addition, the recommended corrective measure alternative(s) must meet the following corrective action standards:

a. Protect human health and the environment;

b. Attain corrective action objectives including media cleanup standards;

c. Control the source(s) of releases so as to reduce or eliminate, to the extent practicable, further releases of hazardous wastes (including hazardous constituents) that may pose a threat to human health and the environment; and

d. Comply with any applicable federal, state, and local standards for management of wastes.

The Owner/Operator or Respondent must document how the recommended alternative meets the corrective action standards (a-d above).

8. **Summary of Recommended Corrective Measure Alternative**

Provide a description of the recommended corrective measure alternative and qualitatively describe what the alternative is supposed to do and how it will function at the facility.

ATTACHMENT 8

SCOPE OF WORK FOR CORRECTIVE MEASURES IMPLEMENTATION

PURPOSE

The purpose of the Corrective Measures Implementation (CMI) program is to design, construct, operate, maintain and monitor the performance of the corrective measure or measures selected by the Department. Corrective measures are intended to protect human health and/or the environment from hazardous waste releases from the Facility. The Owner/Operator or Respondent will furnish all personnel, materials and services necessary to implement the corrective measures program.

SCOPE

The documents required for Corrective Measures Implementation are, unless the Department of Toxic Substances Control (Department) specifies otherwise, a Conceptual Design, Operation and Maintenance Plan, Draft Plans and Specifications, Final Plans and Specifications, Construction Workplan, Construction Completion Report, Corrective Measure Completion Report, Health and Safety Plan and Progress Reports. The scope of work (SOW) for each document is specified below. The SOW's are intended to be flexible documents capable of addressing both simple and complex site situations. If the Owner/Operator or Respondent can justify, to the satisfaction of the Department, that a plan and/or report or portions thereof are not needed in the given site specific situation, then the Department may waive that requirement.

The Department may require the Owner/Operator or Respondent to conduct additional studies beyond what is discussed in the SOW's in order to support the CMI program. The Owner/Operator or Respondent will furnish all personnel, materials and services necessary to conduct the additional tasks.

A. Conceptual Design

The Owner/Operator or Respondent shall prepare a Conceptual Design (CD) that clearly describes the size, shape, form, and content of the proposed corrective measure, the key components or elements that are needed, describes the designers vision of the corrective measure in the form of conceptual drawings and schematics, and includes procedures and schedules for implementing the corrective measure(s).

It should be noted that more that one conceptual design may be needed in situations where there is a complex site with multiple technologies being employed at different locations. The CD must be approved by the Department prior to implementation. The CD must, at a minimum, include the following elements:

1. Introduction/Purpose

   Describe the purpose of the document and provide a summary description of the project.

2 Corrective Measure Objectives

   Discuss the corrective measure objectives including applicable media cleanup standards.

3. Conceptual Model of Contaminant Migration

   It is important to know where the contaminants are and to understand how they are moving before an adequate corrective measure can be developed. To address this critical question, the Owner/Operator or Respondent must present a conceptual model of the site and contaminant migration. The conceptual model consists of a working hypothesis of how the contaminants may move from the release source to the receptor population. The conceptual model is developed by looking at the applicable physical parameters (e.g., water solubility, density, Henry's Law Constant, etc.) for each contaminant and assessing how the contaminant may migrate given the existing site conditions (geologic features, depth to groundwater, etc.). Describe the phase (water, soil, gas, non-aqueous) and location where contaminants are likely to be found. This analysis may have already been done as part of earlier work (e.g., Current Conditions Report). If this is the case, then provide a summary of the conceptual model with a reference to the earlier document;

4. Description of Corrective Measures

   Considering the conceptual model of contaminant migration, qualitatively describe what the corrective measure is supposed to do and how it will function at the Facility. Discuss the constructability of the corrective measure and its ability to meet the corrective measure objectives.

5. Data Sufficiency

Review existing data needed to support the design effort and establish whether or not there are sufficient accurate data available for this purpose. The Owner/Operator or Respondent must summarize the assessment findings and specify any additional data needed to complete the corrective measure design. The Department may require or the Owner/Operator or Respondent may propose that sampling and analysis plans and/or treatability study workplans be developed to obtain the additional data. Submittal times for any new sampling and analysis plans and/or treatability study workplans must be included in the project schedule.

6. Project Management

Describe the management approach including levels of authority and responsibility (include organization chart), lines of communication and the qualifications of key personnel who will direct the corrective measure design and implementation effort (including contractor personnel).

7. Project Schedule

The project schedule must specify all significant steps in the process and when all CMI deliverables (e.g., Operation and Maintenance Plan, Corrective Measure Construction Workplan, etc.) are to be submitted to the Department.

8. Design Criteria

Specify performance requirements for the overall corrective measure and for each major component. The Owner/Operator or Respondent must select equipment that meets the performance requirements.

9. Design Basis

Discuss the process and methods for designing all major components of the corrective measure. Discuss the significant assumptions made and possible sources of error. Provide justification for the assumptions;

10. Conceptual Process/Schematic Diagrams.

11. Site plan showing preliminary plant layout and/or treatment area.

12. Tables listing number and type of major components with approximate dimensions.

13. Tables giving preliminary mass balances.

14. Site safety and security provisions (e.g., fences, fire control, etc.).

15. Waste Management Practices

Describe the wastes generated by the construction of the corrective measure and how they will be managed. Also discuss drainage and indicate how rainwater runoff will be managed;

16. Required Permits

List and describe the permits needed to construct and operate the corrective measure. Indicate on the project schedule when the permit applications will be submitted to the applicable agencies and an estimate of the permit issuance date.

17. Long-Lead Procurement Considerations

The Owner/Operator or Respondent shall prepare a list of any elements or components of the corrective measure that will require custom fabrication or for some other reason must be considered as long-lead procurement items. The list must include the reason why the items are considered long-lead items, the length of time necessary for procurement, and recognized sources of such procurement;

18. Appendices including:

Design Data - Tabulations of significant data used in the design effort;

Equations - List and describe the source of major equations used in the design process;

Sample Calculations - Present and explain one example calculation for significant or unique design calculations; and

Laboratory or Field Test Results.

B. Operation and Maintenance Plan

The Owner/Operator or Respondent shall prepare an Operation and Maintenance (O&M) Plan that includes a strategy and procedures for performing operations, long term maintenance, and monitoring of the corrective measure. A draft Operation and Maintenance Plan shall be submitted to the Department simultaneously with the draft Plans and Specifications. A final Operation and Maintenance Plan shall be submitted to the Department simultaneously with the final Plans and Specifications. The O&M plan shall, at a minimum, include the following elements:

1. Introduction/Purpose

Describe the purpose of the document and provide a summary description of the project.

2. Project Management

Describe the management approach including levels of authority and responsibility (include organization chart), lines of communication and the qualifications of key personnel who will operate and maintain the corrective measures (including contractor personnel);

3. System Description

Describe the corrective measure and identify significant equipment.

4. Personnel Training

Describe the training process for O&M personnel. The Owner/Operator or Respondent shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, start up and operation of the treatment systems, and training covering appropriate operational procedures once the start-up has been successfully accomplished.

5. Start-Up Procedures

Describe system start-up procedures including any operational testing.

6. Operation and Maintenance Procedures

Describe normal operation and maintenance procedures including:

a. Description of tasks for operation;
b. Description of tasks for maintenance;
c. Description of prescribed treatment or operation conditions; and
d. Schedule showing frequency of each O&M task.

7. Replacement schedule for equipment and installed components.

8. Waste Management Practices

Describe the wastes generated by operation of the corrective measure and how they will be managed. Also discuss drainage and indicate how rainwater runoff will be managed.

9. Sampling and monitoring activities may be needed for effective operation and maintenance of the corrective measure. If sampling activities are necessary, the O&M plan must include a complete sampling and analysis section which specifies the following information:

a. Description and purpose of monitoring tasks;
b. Data quality objectives;
c. Analytical test methods and detection limits;
d. Name of analytical laboratory;
e. Laboratory quality control (include laboratory QA/QC procedures in appendices)
f. Sample collection procedures and equipment;
g. Field quality control procedures:
   - o duplicates (10% of all field samples)
   - o blanks (field, equipment, etc.)
   - o equipment calibration and maintenance
   - o equipment decontamination
   - o sample containers
   - o sample preservation
   - o sample holding times (must be specified)
   - o sample packaging and shipment
   - o sample documentation (field notebooks, sample labeling, etc);
h. Criteria for data acceptance and rejection; and
i. Schedule of monitoring frequency.

The Owner/Operator or Respondent shall follow all EPA guidance for sampling and analysis. The Department may request that the sampling and analysis section be a separate document.

10. Corrective Measure Completion Criteria

Describe the process and criteria (e.g., groundwater cleanup goal met at all compliance points for 1 year)

for determining when corrective measures may cease. Also describe the process and criteria for determining when maintenance and monitoring may cease. Criteria for corrective measures such as a landfill cap must be carefully crafted to account for the fact that a landfill cap will never actually "cease" but will need to be maintained and monitored for a long period of time. Satisfaction of the completion criteria will trigger preparation and submittal of the Corrective Measures Completion Report.

11. O&M Contingency Procedures:

a. Procedures to address system breakdowns and operational problems including a list of redundant and emergency back-up equipment and procedures;

b. Should the corrective measure suffer complete failure, specify alternate procedures to prevent release or threatened releases of hazardous substances, pollutants or contaminants which may endanger public health and/or the environment or exceed cleanup standards;

c. The O&M Plan must specify that, in the event of a major breakdown and/or complete failure of the corrective measure (includes emergency situations), the Owner/Operator or Respondent will orally notify the Department within 24 hours of the event and will notify the Department in writing within 72 hours of the event. The written notification must, at a minimum, specify what happened, what response action is being taken and/or is planned, and any potential impacts on human health and/or the environment; and

d. Procedures to be implemented in the event that the corrective measure is experiencing major operational problems, is not performing to design specifications and/or will not achieve the cleanup goals in the expected timeframe. For example, in certain circumstances both a primary and secondary corrective measure may be selected for the Facility. If the primary corrective measure were to fail, then the secondary would be implemented. This section would thus specify that if the primary corrective measure failed, then design plans would be developed for the secondary measure.

12. Data Management and Documentation Requirements

Describe how analytical data and results will be evaluated, documented and managed, including development of an analytical database. State the criteria that will be used by the project team to review and determine the quality of data.

The O&M Plan shall specify that the Owner/Operator or Respondent collect and maintain the following information:

a. Progress Report Information

- o Work Accomplishments (e.g., performance levels achieved, hours of treatment operation, treated and/or excavated volumes, concentration of contaminants in treated and/or excavated volumes, nature and volume of wastes generated, etc.).

- o Record of significant activities (e.g., sampling events, inspections, problems encountered, action taken to rectify problems, etc.).

b. Monitoring and laboratory data;
c. Records of operating costs; and
d. Personnel, maintenance and inspection records.

These data and information should be used to prepare Progress Reports and the Corrective Measure Completion Report.

C. Draft Plans and Specifications

[Note - The Owner/Operator or Respondent may propose or the Department may require the submittal of other draft plans and specifications.

The Owner/Operator or Respondent shall prepare draft Plans and Specifications that are based on the Conceptual Design but include additional design detail. A draft Operation and Maintenance Plan and Construction Workplan shall be submitted to the Department simultaneously with the draft Plans and Specifications. The draft design package must include drawings and specifications needed to construct the corrective measure. Depending on the nature of the corrective measure, many different types of drawings and specifications may be needed. Some of the elements that may be required are:

- General Site Plans
- Process Flow Diagrams
- Mechanical Drawings
- Electrical Drawings
- Structural Drawings
- Piping and Instrumentation Diagrams
- Excavation and Earthwork Drawings
- Equipment Lists
- Site Preparation and Field Work Standards
- Preliminary Specifications for Equipment and Material

General correlation between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications to the Department, the Owner/Operator or Respondent shall:

a. Proofread the specifications for accuracy and consistency with the conceptual design; and

b. Coordinate and cross-check the specifications and drawings.

D. Final Plans and Specifications (100% Design Point)

The Owner/Operator or Respondent shall prepare final Plans and Specifications that are sufficient to be included in a contract document and be advertised for bid. A final Operation and Maintenance Plan and Construction Workplan shall be submitted to the Department simultaneously with the final Plans and Specifications. The final design package must consist of the detailed drawings and specifications needed to construct the corrective measure. Depending on the nature of the corrective measure, many different types of drawings and specifications may be needed. Some of the elements that may be required are:

- General Site Plans
- Process Flow Diagrams
- Mechanical Drawings
- Electrical Drawings
- Piping and Instrumentation Diagrams
- Structural Drawings
- Excavation and Earthwork Drawings
- Site Preparation and Field Work Standards
- Construction Drawings
- Installation Drawings
- Equipment Lists
- Detailed Specifications for Equipment and Material

General correlation between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the final project specifications to the Department, the Owner/Operator or Respondent shall:

a. Proofread the specifications for accuracy and consistency with the preliminary design; and

b. Coordinate and cross-check the specifications and drawings.

E. Construction Workplan

The Owner/Operator or Respondent shall prepare a Construction Workplan which documents the overall management strategy, construction quality assurance procedures and schedule for constructing the corrective measure. A draft Construction Workplan shall be submitted to the Department simultaneously with the draft Plans and Specifications and draft Operation and Maintenance Plan. A final Construction Workplan shall be submitted to the Department simultaneously with the final Plans and Specifications and final Operation and Maintenance Plan. Upon receipt of written approval from the Department, the Owner/Operator or Respondent shall commence the construction process and implement the Construction Workplan in accordance with the schedule and provisions contained therein. The Construction Workplan must be approved by the Department prior to the start of corrective measure construction. The Construction Workplan must, at a minimum, include the following elements:

1. Introduction/Purpose

   Describe the purpose of the document and provide a summary description of the project.

2. Project Management

   Describe the construction management approach including levels of authority and responsibility (include organization chart), lines of communication and the qualifications of key personnel who will direct the corrective measure construction effort and provide construction quality assurance/quality control (including contractor personnel);

3. Project Schedule

   The project schedule must include timing for key elements of the bidding process, timing for initiation and completion of all major corrective measure construction tasks as specified in the Final Plans and Specifications, and specify when the Construction Completion Report is to be submitted to the Department;

4. Construction Quality Assurance/Quality Control Program

   The purpose of construction quality assurance is to ensure, with a reasonable degree of certainty, that a completed corrective measure will meet or exceed all design criteria, plans and specifications. The Construction Workplan must include a complete construction quality assurance program to be

implemented by the Owner/Operator or Respondent.

5. Waste Management Procedures

Describe the wastes generated by construction of the corrective measure and how they will be managed.

6. Sampling and Analysis

Sampling and monitoring activities may be needed for construction quality assurance/quality control and/or other construction related purposes. If sampling activities are necessary, the Construction Workplan must include a complete sampling and analysis section which specifies the following information:

a. Description and purpose of monitoring tasks;
b. Data quality objectives;
c. Analytical test methods and detection limits;
d. Name of analytical laboratory;
e. Laboratory quality control (include laboratory QA/QC procedures in appendices)
f. Sample collection procedures and equipment;
g. Field quality control procedures:
   - o duplicates (10% of all field samples)
   - o blanks (field, equipment, etc.)
   - o equipment calibration and maintenance
   - o equipment decontamination
   - o sample containers
   - o sample preservation
   - o sample holding times (must be specified)
   - o sample packaging and shipment
   - o sample documentation (field notebooks, sample labeling, etc);
h. Criteria for data acceptance and rejection; and
i. Schedule of monitoring frequency.

The Owner/Operator or Respondent shall follow all Department and USEPA guidance for sampling and analysis. The Department may request that the sampling and analysis section be a separate document.

7. Construction Contingency Procedures

a. Changes to the design and/or specifications may be needed during construction to address unforeseen problems encountered in the field. Procedures to address such circumstances, including notification of the Department, must be included in the Construction Workplan;

b. The Construction Workplan must specify that, in

the event of a construction emergency (e.g., fire, earthwork failure, etc.), the Owner/Operator or Respondent will orally notify the Department within 24 hours of the event and will notify the Department in writing within 72 hours of the event. The written notification must, at a minimum, specify what happened, what response action is being taken and/or is planned, and any potential impacts on public health and/or the environment; and

c. Procedures must be implemented if unforeseen events prevent corrective measure construction. For example, in certain circumstances both a primary and secondary corrective measure may be selected for the Facility. If the primary corrective measure could not be constructed, then the secondary would be implemented. This section would thus specify that if the primary corrective measure could not be constructed, then design plans would be developed for the secondary measure.

8. Construction safety procedures should be specified in a separate Health and Safety Plan.

9. Data Management and Documentation Requirements

Describe how analytical data and results will be evaluated, documented and managed, including development of an analytical database. State the criteria that will be used by the project team to review and determine the quality of data.

The Construction Workplan shall specify that the Owner/Operator or Respondent collect and maintain the following information:

a. Progress Report Information

- Work Accomplishments (e.g., hours of operation, excavated volumes, nature and volume of wastes generated, area of cap completed, length of trench completed, etc.).
- Record of significant activities (e.g., sampling events, inspections, problems encountered, action taken to rectify problems, etc.).

b. Monitoring and laboratory data;

c. Records of construction costs; and
d. Personnel, maintenance and inspection records.

This data and information should be used to prepare progress reports and the Construction Completion Report.

10. Cost Estimate/Financial Assurance

If financial assurance for corrective measure construction and operation is required by an enforcement order, facility permit, or through use of Department discretion, the Construction Workplan must include a cost estimate, specify which financial mechanism will be used and when the mechanism will be established. The cost estimate shall include both construction and operation and maintenance costs. An initial cost estimate shall be included in the draft Construction Workplan and a final cost estimate shall be included in the final Construction Workplan. The financial assurance mechanism may include a performance or surety bond, a trust fund, a letter of credit, financial test and corporate guarantee equivalent to that in 40 CFR 265.143 or any other mechanism acceptable to the Department.

Financial assurance mechanisms are used to assure the Department that the Owner/Operator or Respondent has adequate financial resources to construct and operate the corrective measure.

F. Construction Completion Report

The Owner/Operator or Respondent shall prepare a Construction Completion (CC) Report which documents how the completed project is consistent with the Final Plans and Specifications. A CC Report shall be submitted to the Department when the construction and any operational tests have been completed. The CC Report shall, at a minimum, include the following elements:

1. Purpose;

2. Synopsis of the corrective measure, design criteria, and certification that the corrective measure was constructed in accordance with the Final Plans and Specifications;

3. Explanation and description of any modifications to the Final Plans and Specifications and why these were necessary for the project;

4. Results of any operational testing and/or monitoring, indicating how initial operation of the corrective measure compares to the design criteria;

5. Summary of significant activities that occurred during construction. Include a discussion of problems encountered and how they were addressed;

6. Summary of any inspection findings (include copies of key inspection documents in appendices);

7. As built drawings; and

8. A schedule indicating when any treatment systems will begin full scale operations.

ATTACHMENT 9

SCOPE OF WORK FOR PROGRESS REPORTS

Progress reports shall, at a minimum, include:

1. All actions taken during the reporting period to achieve compliance with the Order;

2. A summary of any findings made during the reporting period;

3. All problems or potential problems encountered during the reporting period (also discuss problem solutions);

4. All projected work for the next reporting period as well as anticipated problems and avoidance measures;

5. A discussion of any changes in personnel that occurred during the reporting period;

6. Summaries of all contacts with representatives of the press local community or public interest groups; and

7. If requested by the Department, the results of any sampling, tests or other data generated during the RCRA Facility Investigation or Corrective Measures Study.